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AMERICAN
DYESTUFF REPORTER

Devoted to Textile Chemistry
BLEACHING • DYEING • PRINTING • FINISHING

Annual Processing Review Number

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OFFICIAL PUBLICATION OF THE PROCEEDINGS AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS

American Dyestuff Reporter was founded in 1917 and the Textile Colorist and Converter (formerly Textile Colorist) was incorporated with it in January, 1949. Published every other Monday by the HOWES PUBLISHING COMPANY, INC., 44 E. 23rd Street, New York 10, N. Y. C. R. Howes, President; Ernest J. Finan, Executive Vice-President; Norman A. Johnson, Vice-President & Treasurer; Myron D. Reeser, Vice-President; C. Essenbreis, Secretary.

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Annual Processing Review Number

AMERICAN

DYESTUFF REPORTER

VOLUME 43 | DECEMBER 6, 1954 | NUMBER 25

Alphabetical List of NEW PRODUCTS *Developed Since November, 1953*

Coloring Materials ..... **Page 807**
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WITH the co-operation of manufacturers of dyestuffs, textile chemicals, and wet processing and laboratory equipment, we have prepared the accompanying list of products which, it is understood, have been placed on the market or further developed since November, 1953. The list of products has been subdivided according to the classifications mentioned and the individual products are listed in alphabetical order (except for equipment). The name of the manufacturer, in an abbreviated form, appears directly below the name of the product. In many cases the abbreviated name of the manufacturer will immediately indicate to the reader the full name of the company. However, below we have listed alphabetically the key name of the manufacturer together with the complete firm name and address.

We have tried to make this list as complete and accurate as possible but there may be some unintentional omissions or errors. If so, we shall be pleased to have such matters brought to our attention immediately. We have depended upon the manufacturers to supply us with a complete list of their new products together with information concerning them. The properties claimed for these products are those claimed by the manufacturers. The information which we publish is necessarily in a brief form inasmuch as lack of space prohibits the publication of complete details concerning any product. We hope, however, that the information as it appears is sufficiently comprehensive to give the reader a specific idea of the properties and intended uses of the product.

KEY TO MANUFACTURERS' NAMES

ABBEON—Abbeon Supply Co, 179-25 Jamaica Ave, Jamaica 32, N Y

ACETO—Aceto Chemical Co, Inc, 40-40 Lawrence St, Flushing 54, N Y

ALCO—Alco Oil & Chemical Corp, Trenton Ave and William St, Philadelphia 34, Pa

AMALGAMATED—Amalgamated Chemical Corp, Rorer and Ontario Sts, Philadelphia 34, Pa

AMERICAN ALCOLAC—American Alcolac Corp, 3440 Fairfield Rd, Baltimore 26, Md

AMERICAN ANILINE—American Aniline Products, Inc, 50 Union Sq, New York 3, N Y

AMERICAN ANILINE & EXTRACT—American Aniline & Extract Co, Inc, Venango and F Sts, Philadelphia, Pa

AMERICAN MONOMER—American Monomer Corp, 511 Lancaster St, Leominster, Mass

AMERICAN POLYMER—American Polymer Co of the Chemical Division of The Borden Co, 101 Foster St, Peabody, Mass

AMERICAN RESINOUS—American Resinous Chemicals Corp, 103 Foster St, Peabody, Mass

ANALYTICAL—Analytical Measurements, Inc, 585 Main St, Chatham, N J

ARCHER-DANIELS-MIDLAND — Archer-Daniels-Midland Co, Chemical Products Div, 2191 West 110th St, Cleveland 2, O

ARKANSAS—Arkansas Co, Inc, P O Box 210, Newark 1, N J

ARMOUR—Armour and Co, Industrial Soap Dept, 1355 West 31st St, Chicago 9, Ill

ARNOLD, HOFFMAN—Arnold, Hoffman & Co, Inc, 55 Canal St, Providence 1, R I

ATLANTIC CHEMICAL—Atlantic Chemical Corp, 153 Prospect St, Passaic, N J

AULA—Aula Chemicals, Inc, P O Box 494, 714 Division St, Elizabeth, N J

BERKSHIRE—Berkshire Color & Chemical Co, Pine and Cherry Sts, Delawanna, N J

BERKSHIRE CORP—Berkshire Color & Chemical Corp, Springfield, Mass

BIRCH—Birch Brothers, Inc, 32 Kent St, Somerville 43, Mass

BURKART-SCHIER—Burkart-Schier Chemical Co, Chattanooga, Tenn

CARBIDE AND CARBON—Carbide and Carbon Chemicals Co, A Division of Union Carbide and Carbon Corp, 30 East 42nd St, New York 17, N Y

CIBA—Ciba Co, Inc, 627 Greenwich St, New York 14, N Y

COLLOIDS—Colloids, Inc, 394-8 Frelinghuysen Ave, Newark 5, N J

CONTINENTAL—Continental Chemical Co, 195 Twenty-first Ave, Paterson, N J

CUSTOM SCIENTIFIC—Custom Scientific Instruments, Inc, 541-543 Devon St, Arlington, N J

CYANAMID—RESIN—American Cyanamid Co, Textile Resin Dept, 30 Rockefeller Plaza, New York 20, N Y

CYANAMID—DYESTUFF—American Cyanamid Co, Organic Chemicals Div, Dyestuff Dept, Bound Brook, N J

DE PAUL—De Paul Chemical Co, Inc, 44-27 Purvis St, Long Island City 1, N Y

DECK—Textil Machinen Fabrick Deck, Merkurstrasse 34, Zurich 7, Switzerland

DEXTER—Dexter Chemical Corp, 819 Edgewater Rd, New York 59, N Y

Du PONT—E I du Pont de Nemours & Co, Inc, Wilmington, Del

EASTERN—Eastern Color & Chemical Co, 137-139 Canal St, Providence 3, R I

ECO—Eco Engineering Co, 12 New York Ave, Newark 1, N J

EMERY—Emery Industries, Inc, Cincinnati 2, O

EMKAY—Emkay Chemical Co, 319-325 Second St, Elizabeth, N J

FABRIC DEVELOPMENT—Fabric Development Tests, P O Box 45, Brooklyn 32, N Y

FANCOURT—W F Fancourt Co, 516 South Delaware Ave, Philadelphia 47, Pa

FEELEY—E J Feeley Co, 650 State St, Charlotte, N C

FIBER CHEMICAL—Fiber Chemical Corp, P O Box 218, Matawan, N J

FOXBORO—The Foxboro Co, Foxboro, Mass

FRITZCHE—Fritzche Brothers, Inc, 76 Ninth Ave, New York 11, N Y

GABB—Gabb Special Products Div of the E Horton & Son Co, Windsor Locks, Conn

GEIGY—Geigy Dyestuffs Div of Geigy Chemical Corp, 89 Barclay St, New York 8, N Y

GENERAL ANILINE—General Aniline & Film Corp, Dyestuff and Chemical Div, 435 Hudson St, New York 14, N Y

GENERAL DYESTUFF—General Dyestuff Co, a sales division of General Aniline & Film Corp, 435 Hudson St, New York 14, N Y

GOODRICH—B F Goodrich Chemical Co, Rose Bldg, 2060 E Ninth St, Cleveland 15, O

HART—The Hart Products Corp, 1440 Broadway, New York 18, N Y

HILTON-DAVIS—The Hilton-Davis Chemical Co Division of Sterling Drug Inc, 2235 Langdon Farm Rd, Cincinnati 13, O

HUNTER—James Hunter Machine Co, North Adams, Mass

IMPERIAL—Imperial Paper and Color Corp, Pigment Color Division, Glens Falls, N Y

INTERCHEMICAL—Interchemical Corp, Textile Colors Div, Hawthorne, N J

JACQUES WOLF—Jacques Wolf & Co, Passaic, N J

JERSEY STATE—Jersey State Chemical Co, 59 Lee Ave, Haledon, N J

LAUREL—Laurel Soap Manufacturing Co, Inc, Tioga, Thompson and Almond Sts, Philadelphia 34, Pa

MAC—Mac Chemical Co, 5113 Kingston Pike, P O Box 10001, Knoxville, Tenn

MAY—Otto B May, Inc, 52 Amsterdam St, Newark 5, N J

METRO-ATLANTIC—Metro-Atlantic, Inc, Centredale 11, R I

MONA—Mona Industries, Inc, 65-75 E 23rd St, Paterson 4, N J

NATIONAL—National Aniline Division, Allied Chemical & Dye Corp, 40 Rector St, New York 6, N Y

NATIONAL MILLING—National Milling & Chemical Co, 4601 Nixon St, Philadelphia 27, Pa

NOPCO—Nopco Chemical Co, Inc, Harrison, N J

NOVA—Nova Chemical Corp, 147-153 Waverly Pl, New York 14, N Y

NYANZA—Nyanza Color & Chemical Co, Inc, 109 Worth St, New York 13, N Y

ONYX—Onyx Oil & Chemical Co, Warren & Morris Sts, Jersey City 2, N J

ORGANIC—Organic Chemical Corp, P O Box 432, Providence 1, R I

PENICK & FORD—Penick & Ford Ltd, 420 Lexington Ave, New York 17, N Y

PHARMA—Pharma Chemical Corp, 175 Fifth Ave, New York 10, N Y

PIONEER—Pioneer Chemical Works, Inc, 940 N Delaware Ave, Philadelphia 23, Pa

PROCTER & GAMBLE—The Procter & Gamble Distributing Co, Cincinnati 1, O

PROGRESSIVE—Progressive Color and Chemical Co, 350 Fifth Ave, New York 1, N Y—representatives of Farbwerke Hoechst AG, Frankfurt (M)—Hoechst, West Germany

QUAKER—Quaker Chemical Products Corp, Conshohocken, Pa

REFINED—Refined Products Corp, 624-634 Schuyler Ave, Lyndhurst, N J

RODNEY HUNT—Rodney Hunt Machine Co, Orange, Mass

ROHM & HAAS—Rohm & Haas Co, Washington Sq, Philadelphia 5, Pa

ROYCE—Royce Chemical Co, Carlton Hill, N J

RUMFORD—Rumford Chemical Works, Rumford 16, R I

SANDOZ—Sandoz Chemical Works, Inc, 61-63 Van Dam St, New York 13, N Y

SEYDEL-WOOLLEY—Seydel-Woolley & Co, Box 36, Sta D, Atlanta, Ga

STANDARD CHEMICAL—Standard Chemical Products, Inc, Hoboken, N J

TANATEX—The Tanatex Corp, Belleville Turnpike, Kearny, N J

TANNER—Chas S Tanner Co, 250 South Water St, Providence 3, R I

TEX-CHEM—Tex-Chem Co, 20-21 Wagaraw Rd, Fair Lawn, N J

TREPLOW—Treplow Products, Inc, 59 Camden St, Paterson, N J

VERSENES—Versenes Inc, Framingham, Mass

WARWICK—Warwick Chemical Co, a Division of Sun Chemical Corp, 10th St and 44th Ave, Long Island City 1, N Y

WICA—Wica Chemicals, Inc, P O Box 506, Charlotte, N C

WOONSOCKET—Woonsocket Color & Chemical Co, Woonsocket, R I

COLORING MATERIALS

ACID ANTHRACENE RED 3BL
(General Dyestuff)

A prewar milling acid dyestuff, which has again become available for dyeing bright red shades said to be of good light fastness, very good fastness to carbonizing and excellent fastness to hot pressing on wool raw stock, slubbing, and yarn from a weakly acid bath. It is recommended for use on wool that is used finally for carpets, knitting yarns, blankets, and flannels, or for any purpose where light and wash fastness are important. These properties are especially advantageous for knitted articles and multicolored rugs that are washed or shampooed where whites and other colors must remain clear. In union dyeing this dyestuff leaves cellulosic fibers clean but stains silk.

AHCOVAT DIRECT BLACK AC DOUBLE PASTE
(Arnold, Hoffman)

Said to be a washfast, lightfast, full-shade black which does not require hypochlorite aftertreatment for development. It may be dyed by Method 4 at 140°F or alternatively by Method 1 (IN) at 140°F. Ahcovat Direct Black AC Double Paste is suitable for application by package, beck, pad, jig, and continuous methods. Its stability at high temperatures is good.

AHCOVAT SOLUBLE BROWN IR POWDER (C I 1151)
(Arnold, Hoffman)

This is a new dyestuff of considerable interest to the textile printer and dyer. It is readily applied by conventional printing methods including the nitrite, chromate-acid age, and sulfocyanide processes, and may be dyed by padding or long-bath procedures. Ahcovat Soluble Brown IR Powder is recommended by the manufacturers for the production of level, well-penetrated dyeings on high-twist yarns and tightly woven fabrics where satisfactory results would be difficult to obtain by normal vat dyeing methods. A wide variety of fast brown shades are produced by using this dye in combination with Ahcovat Soluble Golden Yellow IGK and Ahcovat Soluble Brown IBR. This dye is said to possess excellent wet-fastness properties and has very good to excellent fastness to light.

AHCOVAT SOLUBLE GREEN IB PASTE (C I 1101)
(Arnold, Hoffman)

This is said to represent a considerable improvement over previous paste types of leuco esters of Jade Green B. The all-too-familiar problems presented by poor print paste possibility and relatively short storage life, problems associated with old types, are said to have been overcome considerably as a result of this newly developed type. It is stated that the new Ahcovat Soluble Green IB Paste has an excellent rate of fixation, and working and fastness properties are exemplary. The new physical characteristics of this product will be a positive aid to both screen and roller printers who prefer to use the paste type.

ALGOL* PRINTING BLACK WW CONC PASTE
(General Dyestuff)

A new vat dyestuff, which is said to be characterized by richness of shade, excellence of working properties and exceptional economy for printing full blacks of very good (6) light fastness, very good (4) fastness to washing, fair-to-good (2-3) fastness to chlorine, excellent (5) fastness to hot pressing, and poor (1) fastness to plissé finishing. It is claimed that the resistance to light of full shades is not only adequate for all general clothing uses, but that it is on a sufficiently high level to give this dyestuff an important role for printing economical blacks on upholstery and drapery fabrics for which maximum light fastness is not expected. Although this black is recommended primarily for black shades, it does give greys of good (5) light fastness.

* Registered Trade-mark

ALGOSOL* BLUE IBC POWDER
(General Dyestuff)

A leuco ester in powder form, which is a companion product for the paste brand, in comparison with which it is claimed to be equal in shade, strength, and working properties for all the purposes for which the paste brand has been so successfully employed. Algosol Blue IBC is recommended for use in printing cottons and rayons alongside Rapidogen and Rapid Fast dyestuffs with development in either neutral or acid aging. For dyeing cellulosic textiles it is said to be particularly advantageous because of excellence of penetration, levelness, and solidity of coverage for light shades and pastels on piece goods and on yarns in circulating machines, being superior for such light colors to the regular vat dyestuffs. The fastness properties are the same as those for the old well-known Indanthrene Blue BF, from which it is derived and which is formed in the fiber in the application of Algosol Blue IBC.

* Registered Trade-mark

ALGOSOL* PRINTING YELLOW 4G
(General Dyestuff)

A new Algosol leuco-ester dyestuff for printing bright lemon yellow shades of good tinctorial value, which is fully equal in shade and strength to Algosol Yellow GCA-CF, but which has the important advantage of much better stability to electrolyte when made up into a print paste. The fastness to light of prints of this new dyestuff is the same as that of the GCA-CF, namely fairly good (4) for heavy prints, and the fastness to chlorine and fastness to washing are both somewhat inferior but still good (4). In making up this color it is essential that it be dissolved in water at 160°F to bring out the superior electrolyte stability.

* Registered Trade-mark

ALIZARINE CYANINE GREEN GWA-CF
(General Dyestuff)

A straight anthraquinone type of dyestuff, which is applicable by chrome dyeing methods on wool and by acid or neutral dyeing methods on wool, nylon, and silk. It gives the same bluish-green self shades as some of the other Alizarine Cyanine Greens G but differs chemically from these and all other dyestuffs of a similar shade. As a consequence of this chemical difference, dyeings of the GWA-CF brand on wool, carried out either with or without chrome, are claimed to be faster to both fulling and washing than dyeings of these older greens of similar shade. Dyeings on silk and nylon dyed with or without acid are said also to be faster to washing while being at the same time fully as fast to light.

AMACEL* BLUE BNN SUPRA
(American Aniline)

This new addition to this corporation's line of Amacel colors represents a marked improvement in dispersion properties for this important blue. Amacel Blue BNN Supra represents a product whose dispersion borders on the edge of true solution because of the extreme colloidal nature of its suspension in water. Such a suspension is said to be quite stable to extreme conditions of heat without tarring and serves to promote a more level dyeing with better exhaust from the dyebath. Amacel Blue BNN Supra is an anthraquinone derivative and is absorbed well at both low and high temperatures to produce bright neutral blues on acetate and is somewhat green blue shade on nylon.

* Reg U S Pat Off

AMACEL* BLUE LWGF
(American Aniline)

This is a new member of the Amacel family which results from years of extensive research on the subject of acetate blues which are fast to atmospheric fading. It is a reddish blue, said to possess excellent light fastness, good wash fastness and excellent resistance to atmospheric fading. This color is quite suitable for application in conventional jig equipment. This is said to be particularly true because of the excellent dyeing properties exhibited by this color at lower temperatures. It is stated that it offers excellent stability to conditions of boiling and also exhibits a definite resistance to tarring at high temperatures. Amacel Blue LWGF shows no loss in shade after a 30 minute wash to 110°F in 2% soap solution.

* Reg U S Pat Off

AMACEL* BRILLIANT BLUE B EXTRA SUPRA
(American Aniline)

This new addition to the line of Amacel colors of this concern represents a definite improvement in the dispersion and wetting properties of this product. A water suspension of this color appears to be almost in solution and resists tarring and flocculation even at high temperatures. It is claimed that this color is an excellent choice for the production of very bright blues of moderate light fastness and good resistance to washing. This color may be applied equally well to acetate or nylon and may be applied at both low and high temperature with excellent exhaust. Amacel Brilliant Blue B Extra Supra is a color which works well in jigs, becks or package machines.

* Reg U S Pat Off

AMACEL* COLORS FOR PRINTING
(American Aniline)

A range of selected Amacel colors primarily selected for compatibility under the conditions of printing are listed below:

AMACEL PRINTING BLACK MPB
AMACEL PRINTING BLUE BBP CONC
AMACEL PRINTING NAVY BBS CONC
AMACEL PRINTING TURQUOISE B
AMACEL PRINTING BROWN 3G
AMACEL PRINTING BRIGHT GREEN
AMACEL PRINTING DARK GREEN
AMACEL PRINTING ORANGE 3R
AMACEL PRINTING CERISE B EX
AMACEL PRINTING HELIOTROPE R
AMACEL PRINTING YELLOW 5G

These colors are reported as quite suitable for printing acetate, producing prints of excellent definition and detail. The fastness properties are reported as commercial standards. In addition, the dispersion of these colors has been brought about with the thought of end use compatibility with thickeners and gums employed in printing. Suitable modifications of printing formulations make these types equally suitable for other fibers such as nylon, Dynel and similar synthetic fibers.

* Reg U S Pat Off

AMACRON* COLORS
(American Aniline)

This is a completely new line of dyestuffs resulting from extensive research and development to provide colors of excellent fastness properties for the dyeing of Dacron polyester fiber. The present line is composed of the following colors:

AMACRON YELLOW GLS
AMACRON ORANGE LS
AMACRON RED BLS
AMACRON RED VIOLET LS
AMACRON BLUE RLS

As applied to Dacron by either carrier dyeing techniques or high temperature methods these colors are said to exhibit an excellent fastness to light as well as fastness to sublimation. It is claimed that these colors will resist washing even at temperatures as high as 170°F. With this range of colors it is said to be possible to produce a complete line of shades for Dacron as they work quite well in combination to produce greys, tans, chocolate browns, navy blues and blacks.

* T M Regis Pending

AMALAN* SUPRA COLORS
(American Aniline)

AMALAN SUPRA YELLOW Y
AMALAN SUPRA ORANGE R
AMALAN SUPRA RED G
AMALAN SUPRA BORDEAU G
AMALAN SUPRA DARK BLUE B
AMALAN SUPRA RED BROWN B
AMALAN SUPRA DARK BROWN R
AMALAN SUPRA BLUE GREY R
AMALAN SUPRA DARK OLIVE B
AMALAN SUPRA SCARLET B
AMALAN SUPRA GREEN BL

This complete range of colors comprising 11 distinct shades are newly developed metal complex azo dyes which are said to offer outstanding light and wet fastness as applied from a neutral or mildly acid dyebath. This new dyeing property has a distinct advantage as it is said to minimize much of the corrosion of equipment normally experienced with acid dyeing colors. They are particularly suited for application to wool and nylon as well as silk and other protein fibers. It is stated that they are generally rated from five to seven in fastness to light, four to five in fastness to washing at 120°F, four to five in fastness to milling, five in fastness to sea water, four to five in fastness to perspiration, carbonizing and decating.

* Reg U S Pat Off

AMANIL* FAST TURQUOISE LB
(American Aniline)

This new direct color is a brilliant greenish shade of blue which is said to combine an excellent light fastness with brilliance of shade. It is stated that this combination makes this color particularly desirable because so often it is impossible to obtain brightness as well as light fastness. Amanil Fast Turquoise LB is a level dyeing color with a medium rate of dyeing.

* Reg U S Pat Off

AMANIL* NAPTHOL AS-E
(American Aniline)

This new Amanil Napthol is said to be particularly well suited for the production of bright shades of oranges, scarlets, and reds. These shades are said to be good to very good in fastness to light, hot pressing, chlorine fastness

* Reg U S Pat Off

and washing. Amanil Napthol AS-E is a non-substantive Napthol, consequently, it is highly recommended by the manufacturers for pad-jig and pad continuous operations. It is also suitable for printing with Amanil Fast Color Salts or Amanil Fast Color Bases.

AMANIL* NAPTHOL AS-KB
(American Aniline)

This new Napthol is particularly recommended by the manufacturers for light shades of pink where light fastness is a particular requirement. This is particularly true when this Amanil Napthol is coupled with Amanil Fast Scarlet R Salt. A range of shades from pink through violet of improved light fastness, may be obtained with other Amanil Fast Color Salts. The relatively low substantivity of this Amanil Napthol is said to make it particularly attractive for pad-jig or pad-continuous development methods.

* Reg U S Pat Off

AMANIL* NAPTHOL AS-PH
(American Aniline)

This new Napthol as coupled with Fast Orange GC Salt or Base, Fast Scarlet 2G Salt or Base produces attractive shades of golden orange and orange which are said to offer good to very good fastness to light, good fastness to chlorine, and very good fastness to washing and hot pressing. Various shades of red may be produced by coupling with other Amanil Fast Color Salts to produce a variety of shades with fastness properties similar to those described above. Its non-substantive nature makes it quite suitable for padding followed by coupling either on jig or by continuous methods. It is also quite suitable for dyeing of warps. This particular Amanil Napthol is said to be considered highly desirable by the manufacturers of pigments for the production of colors to be used in the paint, varnish and lacquer trade.

* Reg U S Pat Off

AMANIL* SUPRA BLUE LLG
(American Aniline)

A new addition to the line of Amanil Supra colors. This new blue is particularly suited for the dyeing of viscose and cotton. It is stated that, being outstanding in its reserve of other fibers, especially acetate and nylon, this color is quite suitable for use as a direct color or in combination with conventional copper or copper resin after-treatments. It is claimed that it offers a degree of light fastness which is outstanding in the field of direct colors and its wash fastness is considered highly satisfactory.

* Reg U S Pat Off

AMANTHOSOL* BLUE IBC PASTE
(American Aniline)

A new addition to this company's line of soluble vats, Amanthosol Blue IBC Paste represents the same fundamental contribution to such a line as the parent vat color represents to a vat color line. It is stated that the excellence of solubility and ease of application of this color makes it a valuable working tool for the dyer. Amanthosol Blue IBC is claimed to be particularly valuable for producing bright blue shades of light to medium depth on both cotton and viscose in dyeing. Contrary to normal practice with the parent vat this color is said to be extremely useful in printing. It is reported that it is only through application printing of this soluble form that one can realize the excellent fastness to light, washing, boiling, soaping and chlorine inherent with this type.

* Reg U S Pat Off

AMANTHRENE* BLUE BCL DOUBLE PASTE
(American Aniline)

This anthaquinone vat dye is said to be one of the most desirable of the complete vat range. It is claimed to be outstanding in its fastness to light. The excellence of dispersion and paste conditioning exhibited by this color are said to make it ideal for all types of vat color application. It is particularly well suited for a padding followed by continuous development on any of the conventional types of equipment. Its tendency to over reduce at high temperatures may readily be controlled by a suitable addition of proper dextrines or sodium nitrite. Amanthrene Blue BCL Double Paste may be used to produce a range of shades from powder blue to a deep Royal blue. This color is reported as excellent to crocking, shows no change in artificial light, does not exhibit water spotting and shows excellent resistance to washing and mercerizing.

* Reg U S Pat Off

AMANTHRENE* BLUE BCL DOUBLE POWDER
(American Aniline)

This powder brand equivalent of the corresponding paste is particularly suited for those consumers who object to drying out of pastes and difficulties of storing paste. Powder brand incorporates naturally the same fastness properties associated with the paste brand and in addition maintains the excellence of dispersion and general working properties so desirable in the paste. In view of this, this product is recommended by the manufacturers for any of the applications where the paste might be employed, even in the dyeing of packages and beams where the degree of dispersion is of the utmost importance.

* Reg U S Pat Off

AMANTHRENE* FLAVONE GC DOUBLE PASTE
(American Aniline)

This addition to the vat color line of this corporation is the "lemon yellow" of the complete vat range. The greenness of this yellow vat color is said to be outstanding in the range. It is stated that Amanthrene Flavone GC Double Paste, by virtue of excellent paste condition as to dispersion and consistency, is highly recommended for application by all systems of vat color application, whether it be package machine dyeing, normal pad-jig dyeing or continuous dyeing. It is recommended that this color normally be reduced and dyed at temperatures ranging from 120-140°F, however, high temperatures of 190-200°F encountered in continuous application will not detrimentally affect it. The moderate solubility of the leuco from this color makes it unnecessary to add salt to the dyebath to ensure a good exhaust. In pastel depths of Amanthrene Flavone GC Double Paste it is recommended that Levelene* additions to the bath be made to ensure a complete leveling action.

* Reg U S Pat Off

AMANTHRENE* GREEN JF DOUBLE POWDER
(American Aniline)

This new dispersible powder is the companion product to Amanthrene Green JF Double Paste. It is the manufacturer's belief that they are the only manufacturer who supplies both the bright and the flat shades of this color both as pastes and dispersible powders. This product may be employed for the dyeing of cotton and rayon in all types of equipment. It is stated that the excellent dispersion and wetting properties associated with this product makes possible the preparation of suspensions of this color which are readily adaptable to all types of dyeing. Amanthrene Green JF Double Powder is particularly suited for the production of Hunter green shades as well as being a basis for other heavy combination shades.

* Reg U S Pat Off

AMANTHRENE* ORANGE RRT PASTE
(American Aniline)

This new reddish orange vat color is said to provide a means of obtaining not only full reddish oranges but also combination shades of rust and brown having good all around fastness properties. Amanthrene Orange RRT Paste may be reduced and dyed at temperatures ranging from 110-140°F. It is reported that at the high temperatures encountered in continuous application the incorporation of high alkali-labile value dextrins is beneficial in preserving the shade and brilliance of this color.

* Reg U S Pat Off

AMANTHRENE* PINK FFWP PASTE
(American Aniline)

This new addition to the line of this corporation's vat printing colors is reported as outstanding in those properties of performance in printing imposed by the printing industry. The fixation properties as determined by the speed of reduction and reoxidation are defined as optimum for this color. Amanthrene Pink FFWP Paste is reported to be quite resistant to adverse conditions of aging such as unusual, high temperatures giving constant results under a wide range of temperatures. This color is suitable for application prints on both cotton and rayon. Excellent results have been reported with prints of heavy shades on such materials as dobby cloth and other draping fabrics.

* Reg U S Pat Off

AMANTHRENE* (VAT) DIRECT BLACK MB PASTE
(American Aniline)

This new direct dyeing greenish vat black is said to produce excellent shades of black when applied either to piece goods or yarn. The fastness properties of Amanthrene Direct Black MB Paste, specifically light and washing, are said to be fully commensurate with accepted vat fastness requirements. It should be noted that the shade goes slightly redder upon exposure to chlorine. This color provides a very economic means of producing blacks on piece goods or skeins with all types of equipment, continuous or batch. This black couples excellent fastness properties with simplicity of application.

* Reg U S Pat Off

AMANTHRENE* YELLOW PG DOUBLE PASTE
(American Aniline)

A new addition to the line of vat colors featured by this concern, this reddish yellow vat is said to be an important adjunct to the fast color field. It is stated that the excellent dispersion properties represented by Amanthrene Yellow PG Double Paste make it ideally suited for all types of vat color application. It is reported that this color is particularly valuable for aplication by continuous methods of vat dyeing, where the excellent all around fastness to light, washing, chlorine, peroxide and crocking make it a fundamental choice for the production of yellows and combination shades of exceptional fastness. The election of this color is said to be further stimulated by the excellent exhausting and leveling properties which are inherent with this type. Amanthrene Yellow PG Double Paste is quite versatile in that it may be reduced and dyed at temperatures ranging from 110-120°F, in a conventional manner, to 200°F in continuous equipment without fear of destruction of color.

* Reg U S Pat Off

ANTHRA OLIVE G PASTE
(General Dyestuff)

A straight, tinctorially strong vat dyestuff of the Hydron type, which is recommended for dyeing extremely economical olive shades of good-to-very-good (5-6) light fastness and very good (4) fastness to severe washing (no loss by Test No. 3). Although this dyestuff is not fast to chlorine (1), it is said to display good-to-very-good (3-4) resistance to mercerization and plissé finishing. Advantageous properties claimed for so economical a dyestuff is very-good-to-excellent (4-5) resistance to hot pressing and water spotting. Anthra Olive G Paste is applicable by the various vat-dyeing methods, including pigment padding and circulation of pigment before reduction. This vat dye levels well without a retarding agent in reduced dyeing and has the advantage in such work of not requiring reduction in short volume before addition to a dyebath.

ANTHRASOL BLUE BLACK IRD (Patented)
(Progressive)

Leuco ester producing fast to light greys in printing and dyeing.

ANTHRASOL GREEN IGG and 13G (Patented)
(Progressive)

Leuco esters, producing very bright, fast to light yellowish greens.

ANTHRASOL PRINTING BLACK IB (Patented)
(Progressive)

Leuco ester for dark greys and black outline prints.

ANTHRASOL PRINTING BLACK IGR (Patented)
(Progressive)

Leuco ester for fast to light greys in printing and dyeing especially in combination with Anthrasol Blue Black IRD.

ANTHRASOL PRINTING YELLOW 4G (Patented)
(Progressive)

Leuco ester said to produce the greenest yellow available.

ANTHRASOL PRINTING YELLOW I3G (Patented)
(Progressive)

Leuco ester of excellent solubility, not sensitive to electrolytes in print pastes.

ARIDYE ® BLUE FC4G 4779
(Interchemical)

A new resin-bonded pigment color especially formulated for fast-color printing cotton, rayon, acetate, nylon, Dacron and other natural and synthetic fibers. It is useful as a self-shade for producing bright, green-blue shades and in blends for producing compound shades requiring a high degree of fastness. Aridye Blue FC4G is said to have excellent fastness to light; it withstands 300 hours Fade-Ometer exposure. It is stated that it is fast to washing passing a No. 4 wash in accordance with A.A.T.C.C. Standard Test Method 36-54. It is fast to drycleaning either with carbon tetrachloride or perchlorethylene. Aridye Blue FC4G is an excellent color for printing cotton to be plissé; it does not cut out with caustic soda. It is excellent also for discharge printing since it is not affected by hydrosulfite or sodium sulfoxylate formaldehyde.

ARIDYE ® ORANGE FO2R 4869
(Interchemical)

A new resin-bonded pigment color especially formulated for fast-color printing cotton, rayon, acetate, nylon, Dacron and other natural and synthetic fibers. It is stated that, because of its excellent fastness to light and drycleaning, is is particularly useful for printing draperies. It is useful also for blending with Aridye Reds for producing attractive scarlet shades possessing a high degree of fastness. Aridye Orange FO2R is said to withstand 300 hours Fade-Ometer exposure without appreciable fading in heavy, medium, and light cuts. It is stated that it provides excellent fastness to drycleaning either with carbon tetrachloride or perchlorethylene and also provides good fastness to washing on cotton and synthetic fibers when used in conjunction with improved Aridye processes. Aridye Orange FO2R has excellent running properties.

ARIDYE ® ROYAL BLUE FCR 4773
(Interchemical)

A new resin-bonded pigment color made from an improved type of ultramarine blue pigment. It was formulated especially for fast-color printing cotton, rayon, acetate, nylon, Dacron and other natural and synthetic fibers. In heavy cuts it produces bright royal blue shades of good depth. Aridye Royal Blue FCR is said to have excellent fastness to light; it withstands 300 hours Fade-Ometer exposure. It is fast to drycleaning either with carbon tetrachloride or perchlorethylene. It is also fast to washing when used in conjunction with auxiliary Aridye Clears. Aridye Royal Blue FCR is said to have excellent running properties. Color cuts have good stability.

ARIDYE ® VIOLET FC4B 4623
(Interchemical)

A new resin-bonded pigment color especially formulated for fast-color printing cotton, rayon, acetate, nylon, Dacron and other natural and synthetic fibers. It is useful as a self-shade for producing brilliant blue-violet shades and in blends for shading and toning. It is particularly effective for producing bright royal blues, lilac, and lavender shades. Aridye Violet FC4B is said to have excellent fastness to light; it withstands 300 hours Fade-Ometer exposure. It is stated that it is fast to washing passing a No. 4 wash in accordance with AATCC Standard Test Method 36-54. It is fast to drycleaning either with carbon tetrachloride or perchlorethylene. Aridye Violet FC4B is an excellent color for printing cotton to be plisséd; it does not cut out with caustic soda. It is excellent also for discharge printing since it is not affected by hydrosulfite or sodium sulfoxylate formaldehyde.

ARIGEN ® DYES
(Interchemical)

Latest additions to Interchemical's line of stabilized azoic dyes for fast-color printing cotton, spun rayon, and other fabrics include Arigen Yellow G Double Solution and Arigen Orange R Double Solution. They can be applied in conventional gum thickeners or by Interchemical's exclusive Aquadye ® Emulsion method. In many instances, the use of the Aquadye Emulsion method provides better hand, sharper marks, smoother blotches, and ease of application. These new products are particularly useful for printing alongside Aridye ® Colors in the same pattern, thereby enabling the printer to obtain color combinations not otherwise readily or economically obtainable.

ARTISIL DIRECT ORANGE RFL
(Sandoz)

The newest addition to the Sandoz line of colors for acetate, nylon and Dacron, and reported by the manufacturer to be outstanding in the following properties: 1. highly dispersible in plain water which makes it "spotting-free" for pastel shades; 2. the first orange to produce a good union shade on acetate and nylon; 3. extreme fastness to light even in pastel shades on Dacron, as well as on acetate or nylon; 4. excellent fastness to sublimation on acetate and Dacron; 5. excellent wet fastness on Dacron and nylon.

AULABRITE® SERIES 3000 PIGMENT PRINTING COLORS
(Aula)

A new low-cost line of water dispersed resin bonded pigment colors developed as a more stable, lower cost analogue to the well known 7000 Series colors released about two years ago. The new line of colors is suitable for fast color printing on cotton, rayon, acetate, nylon, Dacron, and other fabrics. The Series 3000 colors are available in a wide range of shades and are said to possess excellent fastness properties. They are said to be suitable for application in machine printing on conventional tyes of roller printing machines as well as in screen printing by hand and by modern screen printing machines. The Series 3000 Aulabrite colors are stated to have numerous advantages among which are superior running properties, with excellent linting, sharp marks and smooth blotches. The new line of Aulabrite colors is similar to previous lines in that it enables the operators to clean, with water only, the print rollers, furnishers, blankets, backgreys or screens and other equipment used. Aulabrite Series 3000 colors may be printed alone or in combination with vats, naphthols and stabilized azoic dyes as well as with other soluble dyes to result in the widest variety of color combinations used by the printers. The printed fabrics need only heat curing if Aulabrite colors are used as the sole printing colors. If the patterns contain other colors or dyes beside the Aulabrites, the Aulabrites may be set by the after-treatment necessary for the dyes. Thus, if the Aulabrite colors are co-printed with vats they are set by the vat aging necessary to reduce the vats and if the colors are co-printed with stabilized azoics they may be set by the acid aging necessary to develop the dyes. It is stated that Aulabrite Series 3000 colors may be prepared for printing by simply mixing, in suitable proportions, the color concentrate with the extender and the Low Crock Additive. Aulabrite Series 3000 colors are supplied in the form of color concentrates. They print with the same color strength and brilliance as Series 7000 colors, but they are stated to offer a better money value than the latter. The colors do not bleed and may be employed in plissé work. They may also be used in embossing. Selected colors are claimed to have fastness properties far in excess of 100 hrs Fade-Ometer, therefore, meeting the lightfastness requirements necessary for the highest grade drapery printing. The list of colors available follows.

AULABRITE® BLACK 3111
(Aula)

A carbon black pigment of a brown black cast dispersed in an oil-in-water emulsion of a combination of polyester/amide resins. This new color is stated to be particularly suitable for printing cotton, rayon, acetate, nylon, Fiberglas, and other natural and synthetic fibers. Jet black prints may be obtained by the use of this color. The prints are said to be fast to washing and dry cleaning, to be exceptionally crock resistant, and to have excellent lightfastness properties.

AULABRITE® BLACK 3121
(Aula)

This contains a carbon black pigment of a bluish cast dispersed in an oil-in-water emulsion of a combination of polyester/amide resins. This new color is stated to be particularly suitable for printing cotton, rayon, acetate, nylon, Fiberglas, and other natural and synthetic fibers. The prints are said to be a dense bluish jet black, to be fast to washing and dry cleaning, to be exceptionally crock resistant, and to have excellent lightfastness. This color is also suitable for the printing of pastel gray shades.

AULABRITE® BLUE 3211-3212-3261
(Aula)

Phthalocyanine blue pigments of a reddish cast dispersed in an oil-in-water emulsion of a combination of polyester/amide resins. These new colors are stated to be particularly suitable for printing cotton, rayon, acetate, nylon, Fiberglas, and natural and synthetic fibers. Brilliant blue prints may be obtained with these colors. The prints are said to be fast to washing and dry cleaning, to be exceptionally crock resistant even in deep shades and to have excellent lightfastness properties.

AULABRITE® BLUE, ROYAL 3221
(Aula)

A brilliant reddish blue pigment dispersed in an oil-in-water emulsion of a combination of polyester/amide resins. This new color is stated to be particularly suitable for printing cotton, rayon, acetate, nylon, Fiberglas, and other natural and synthetic fibers. The prints are said to be fast to washing and dry cleaning, to be exceptionally crock resistant, and to have excellent lightfastness properties.

AULABRITE® BLUE 3231
(Aula)

A phthalocyanine blue pigment of a greenish cast dispersed in an oil-in-water emulsion of a combination of polyester/amide resins. This new color is stated to be particularly suitable for printing cotton, rayon, acetate, nylon, Fiberglas, and other natural and synthetic fibers. The prints are said to be fast to washing and dry cleaning, to be exceptionaly crock resistant, and to have good lightfastness.

AULABRITE® BLUE, NAVY 3241
(Aula)

A deep shade reddish blue pigment dispersed in an oil-in-water emulsion of a combination of polyester/amide resins. This new color is stated to be particularly suitable for printing cotton, rayon, acetate, nylon, Fiberglas, and other natural and synthetic fibers. The prints are said to be fast to washing and dry cleaning, to be exceptionaly crock resistant, and to have good lightfastness.

AULABRITE® BLUE, AQUA 3251
(Aula)

Phthalocyanine blue pigments of suitable shade dispersed in an oil-in-water emulsion of a combination of polyester/amide resins. This new color is stated to be particularly suitable for printing cotton, rayon, acetate, nylon, Fiberglas, and other natural and synthetic fibers. The prints are said to be fast to washing and dry cleaning, to be exceptionally crock resistant and to have excellent lightfastness properties.

AULABRITE® BROWN 3311
(Aula)

A brilliant reddish brown pigment dispersed in an oil-in-water emulsion of a combination of polyester/amide resins. The prints are said to be fast to washing and dry cleaning and to be crock resistant even in deep shades and to have good lightfastness properties, but the pigment used to make this shade sublimes at about 320°F and for that reason, it is not recommended for use wherever high curing temperatures are used or on Fiberglas or under "Quilon." In general, it should be used only where this brilliant shade is required and where there is a close control of curing temperatures. This color is not suitable for plisséing.

AULABRITE® BROWN 3321
(Aula)

A dispersion of an inorganic brown pigment in an oil-in-water emulsion of a combination of polyester/amide resins. This new color is stated to be particularly suitable for printing cotton, rayon, acetate, nylon, Fiberglas and other natural and synthetic fibers. The prints are said to be fast to washing and dry cleaning, to be exceptionally crock resistant, and to have excellent lightfastness properties.

AULABRITE® BROWN 3331
(Aula)

A brilliant red brown pigment dispersed in an oil-in-water emulsion of a combination of polyester/amide resins. This new color is stated to be particularly suitable for printing cotton, rayon, acetate, nylon, Fiberglas, and other natural and synthetic fibers. The prints are said to be fast to washing and dry cleaning, to be exceptionally crock resistant, and to have excellent lightfastness properties.

AULABRITE® BROWN 3341
(Aula)

A dispersion of a brilliant orange brown pigment in an oil-in-water emulsion of a combination of polyester/amide resins. This new color is stated to be particularly suitable for printing cotton, rayon, acetate, nylon, Fiberglas, and other natural and synthetic fibers. The prints are said to be fast to washing and dry cleaning, to be exceptionally crock resistant, and to have excellent lightfastness properties.

AULABRITE® GRAY 3131
(Aula)

A carbon black pigment of a brown gray cast dispersed in an oil-in-water emulsion of a combination of polyester/amide resins. This new color is stated to be particularly suitable for printing cotton, rayon, acetate, nylon, Fiberglas and otner natural and synthetic fibers. Beautiful dark gray and pastel gray prints may be obtained with this color. The prints are said to be fast to washing and dry cleaning, to be exceptionally crock resistant even in the deepest shades and to have excellent lightfastness properties.

AULABRITE® GRAY 3141
(Aula)

A carbon black pigment of a blue-gray cast dispersed in an oil-in-water emulsion of a combination of polyester/amide resins. This new color is stated to be particularly suitable for printing cotton, rayon, acetate, nylon, Fiberglas, and other natural and synthetic fibers. This color is suitable for the printing of bluish gray and oxford gray shades. The prints are said to be fast to washing and dry cleaning, to be exceptionally crock resistant even in the deepest shades, and to have excellent lightfastness properties.

AULABRITE® GREEN 3411-3412-3431
Brilliant yellow cast phthalocyanine green pigments dispersed in oil-in-water emulsions of a combination of polyester/amide resins. These new colors are stated to be particularly suitable for printing cotton, rayon, acetate, nylon, Fiberglas and other natural and synthetic fibers. The prints are said to be fast to washing and dry cleaning, to be exceptionally crock resistant, and to have excellent lightfastness properties.

AULABRITE® GREEN 3421
(Aula)

A deep shade yellow-green pigment dispersed in an oil-in-water emulsion of a combination of polyester/amide resins. This new color is stated to be particularly suitable for printing cotton, rayon, acetate, nylon, Fiberglas, and other natural and synthetic fibers. The prints are said to be fast to washing and dry cleaning, to be exceptionally crock resistant, and to have good lightfastness properties.

AULABRITE® GREEN 3441
A bluisn green pntnalocyanine pigment dispersed in an oil-in-water emulsion of a combination of polyester/amide resins. This new color is stated to be particularly suitable for printing cotton, rayon, acetate, nylon, Fiberglas and other natural and syntnetic tibers. The prints are said to be fast to washing and dry cleaning, to be exceptionally crock resistant, and to nave excellent lighttastness properties.

AULABRITE® ORANGE 3521
(Aula)

A highly inorganic orange pigment dispersed in an oil-in-water emulsion of a combination of polyester/amide resins. This new color is stated to be particularly suitable for printing cotton, rayon, acetate, nylon, Fiberglas, and other natural and synthetic fibers. The prints are said to be fast to washing and dry cleaning, to be exceptionally crock resistant, and to have excellent lightfastness properties.

AULABRITE® ORANGE 3541
(Aula)
A brilliant orange pigment with a yellowish cast dispersed in an oil-in-water emulsion of a combination of polyester/amide resins. This new color is stated to be particularly suitable for printing cotton, rayon, acetate, nylon, Fiberglas and other natural and synthetic fibers. The prints are said to be fast to washing and dry cleaning, to be exceptionally crock resistant, and to have excellent lightfastness properties.

AULABRITE® RED 3611
(Aula)
A brilliant red pigment of a bluish cast dispersed in an oil-in-water emulsion of a combination of polyester/amide resins. This new color is stated to be particularly suitable for printing cotton, rayon, acetate, nylon, Fiberglas and other natural and synthetic fibers. The prints are said to be fast to washing and dry cleaning, to be exceptionally crock resistant, and to have fair lightfastness properties in deep shades.

AULABRITE® RED 3621
(Aula)
A brilliant red pigment dispersed in an oil-in-water emulsion of a combination of polyester/amide resins. This new color is stated to be particularly suitable for printing cotton, rayon, acetate, nylon, Fiberglas and other natural and synthetic fibers. The prints are said to be fast to washing and to dry cleaning with Stoddard Solvent or a naphtha, but should not be used where chlorinated solvents such as perchlorethylene is used as a dry cleaning fluid. The prints have fair lightfastness properties.

AULABRITE® RED 3661-3671-3681
(Aula)
Inorganic red pigments dispersed in oil-in-water emulsions of a combination of polyester/amide resins. These new colors are stated to be particularly suitable for printing cotton, rayon, acetate, nylon, Fiberglas and other natural and synthetic fibers. The prints are said to be fast to washing and dry cleaning, to be exceptionally crock resistant, and to have excellent lightfastness properties.

AULABRITE® RED-PINK 3631
(Aula)
A brilliant red-pink pigment dispersed in an oil-in-water emulsion of a combination of polyester/amide resins. This new color is stated to be particularly suitable for printing cotton, rayon, acetate, nylon, Fiberglas and other natural and synthetic fibers. The prints are said to be fast to washing and dry cleaning, to be exceptionally crock resistant, and to have excellent lightfastness properties.

AULABRITE® RED VIOLET B 3711
(Aula)
Brilliant red violet pigment of a bluish cast dispersed in an oil-in-water emulsion of a combination of polyester/amide resins. This new color is stated to be particularly suitable for printing cotton, rayon, acetate, nylon, Fiberglas and other natural and synthetic fibers. The prints are said to be fast to washing and dry cleaning, to be exceptionally crock resistant, and to have good lightfastness.

AULABRITE® RED VIOLET R 3721
A brilliant red violet pigment dispersed in an oil-in-water emulsion of a combination of polyester/amide resins. This new color is stated to be particularly suitable for printing cotton, rayon, acetate, nylon, Fiberglas and other natural and synthetic fibers. The prints are said to be fast to washing and dry cleaning, to be exceptionally crock resistant, and to have good lightfastness properties.

AULABRITE® SCARLET 3641-3651
(Aula)
Brilliant scarlet pigments dispersed in oil-in-water emulsions of a combination of polyester/amide resins. These new colors are stated to be particularly suitable for printing cotton, rayon, acetate, nylon, Fiberglas and other natural and synthetic fibers. The prints are said to be fast to washing, to be crock resistant even in deep shades, and to have good lightfastness properties. They may be used where they are to be subjected to dry cleaning with Stoddard Solvent or naphtha, but should not be employed where chlorinated solvents such as perchlorethylene are used as dry cleaning fluids.

AULABRITE® VIOLET 3731
A brilliant violet pigment dispersed in an oil-in-water emulsion of a combination of polyester/amide resins. This new color is stated to be particularly suitable for printing cotton, rayon, acetate, nylon, Fiberglas and other natural and synthetic fibers. The prints are said to be fast to washing and dry cleaning, to be exceptionally crock resistant, and to have excellent lightfastness properties.

AULABRITE® WHITE 3821-3828-3829
(Aula)
Titanium dioxide pigments dispersed in oil-in-water emulsions to result in printing compositions giving the maximum capacity and hiding power. These new colors are stated to be particularly suitable for printing cotton, rayon, acetate, nylon, Fiberglas and other natural and synthetic fibers. The prints are said to be fast to washing and dry cleaning, to be exceptionally crock resistant and to have excellent lightfastness properties.

AULABRITE® YELLOW 3911-3921
(Aula)
Inorganic yellow pigments of exceptional brilliance and hiding power dispersed in oil-in-water emulsions of a combination of polyester/amide resins. These new colors are stated to be particularly suitable for printing cotton, rayon, acetate, nylon, Fiberglas and other natural and synthetic fibers. The prints are said to be fast to washing and dry cleaning, to be exceptionally crock resistant, and to have excellent lightfastness properties.

AULABRITE® YELLOW 3941
(Aula)
An inorganic ochre pigment dispersed in an oil-in-water emulsion of a combination of polyester/amide resins. This new color is stated to be particularly suitable for printing cotton, rayon, acetate, nylon, Fiberglas and other natural and synthetic fibers. The prints are said to be fast to washing and dry cleaning, to be exceptionally crock resistant, and to have excellent lightfastness properties.

AULABRITE® YELLOW 3951
(Aula)
A yellow pigment of greenish cast dispersed in an oil-in-water emulsion of a combination of polyester/amide resins. This new color is stated to be particularly suitable for printing cotton, rayon, acetate, nylon, Fiberglas and other natural and synthetic fibers. The prints are said to be fast to washing and dry cleaning, to be exceptionally crock resistant, and to have excellent lightfastness properties.

AULABRITE® YELLOW 3961
(Aula)
A brilliant yellow pigment dispersed in an oil-in-water emulsion of a combination of polyester/amide resins. This new color is stated to be particularly suitable for printing cotton, rayon, acetate, nylon, Fiberglas and other natural and synthetic fibers. The prints are said to be fast to washing and dry cleaning, to be exceptionally crock resistant, and to have fair lightfastness properties.

BERKSHIRE DIAZO BLUE BR
BERKSHIRE DIAZO BLUE BRG
(Berkshire)
These new types of developed colors are said to have good fastness to light and when developed with beta-naphthol good fastness to washing. Both products yield white discharge. Berkshire Diazo Blue BR is the redder type. Berkshire Diazo Blue BRG is one of the greenest and brightest types available.

BERKSHIRE FORMALDEHYDE BLACK GR
(Berkshire)
Pr. 372.

BISMARK BROWN G
(Ciba)
A very desirable brown for the paper trade with satisfactory cold water solubility.

CALCO SOLUBLE VAT BROWN BY
(Cyanamid-Dyestuff)
A soluble leuco ester derived from Calcosol Brown BR Paste. It is said to be different in shade than any competitive Soluble Vat Brown on the market. It is a versatile printing color suitable for roller or screen printing alongside of azoics, pigment or other soluble vats where acid aging is used. It is stated that its excellent leveling properties offer the dyer of cotton, rayon and linen dress goods and shirtings superior appearance of the finished fabric.

CALCODUR RESIN FAST GRAY B
(Cyanamid-Dyestuff)
Calcodur Resin Fast Gray B has been especially developed for the dyeing of viscose or cotton fabrics that are to be finished with durable resin finishes. It is a fast-to-light direct dyestuff of a blue shade of gray and builds up well into full shades. As with other Calcodur Resin Fast colors a minimum of shade change occurs upon resin treating fabrics dyed with the Calcodur Resin Fast Gray B. With or without subsequent resin finishing, this color is said to possess excellent light fastness and good wash fastness. Light fastness is affected to a minor degree whereas the wash fastness is improved when aftertreated with urea-formaldehyde resins.

CALCODUR RESIN FAST GRAY 2G
(Cyanamid-Dyestuff)
A fast-to-light direct dyestuff which has been especially developed for the dyeing of viscose or cotton fabrics that are to be finished with durable resin finishes. It is a gray of greenish cast which builds up well into full shades. As with the other Calcodur Resin Fast colors a minimum of shade change occurs upon resin treating fabrics dyed with Calcodur Resin Fast Gray 2G. This color is said to possess excellent light fastness and good wash fastness either with or without subsequent resin finishing. When aftertreated with urea-formaldehyde resins, only a minor decrease in light fastness can be noted whereas the wash fastness is improved.

CALCOLOID PRINTING YELLOW GCN PASTE
(Cyanamid-Dyestuff)
This product represents a new formulation of Vat Yellow GC which has been processed to perform more efficiently and consistently in a variety of aging conditions with various printing gums. It will give good uniform results under normal mill conditions whenever vat printing is done in cotton or viscose. It is stated that this bright green shade of yellow is universally used for greens and chartreuses which appear in many patterns in all types of work.

CALCOMINE FAST SCARLET YA
(Cyanamid-Dyestuff)
Calcomine Fast Scarlet YA is said to have wide acceptance in the trade because of its excellent working properties on all types of cotton and viscose dyeing. While having only moderate fastness properties, it is a very economical dye to use, particularly in medium and heavy shades.

CALCOMINE YELLOW 6G
(Cyanamid-Dyestuff)
Calcomine Yellow 6G is a new stilbene yellow, which is desirable because of its unusual shade. Calcomine Yellow 6G is slightly redder in shade than Calcomine Yellow 8G, however, it is in the greenest stilbene yellow range of shades available. It is believed that this direct dye will find its greatest use in the coloring of paper. However, it is recommended in the textile field especially in the case of speck dyeing.

CALCOMINE YELLOW 8G
(Cyanamid-Dyestuff)
Calcomine Yellow 8G is a new stilbene yellow, which is said to be highly desirable because of its unusual shade characteristics. It is claimed to be the greenest stilbene yellow available on the market today. It is anticipated that the largest application of this direct dye will be found in coloring paper, especially by beater dyeing. There may be some applications in the textile field, particularly in speck dyeing. For instance, when speck dyeing with Calcomine Diazo Black BHD, it is customary to jet the black with a yellow or orange and this new stilbene yellow should be very suitable for this purpose.

CALCOSOL FAST YELLOW GL PASTE
(Cyanamid-Dyestuff)
This color is a patented, homogeneous vat dyestuff and is related chemically to the widely used Calcosol Fast Yellow Paste. Both colors are said to possess outstanding fastness to light, even in pale shades, and with the introduction of Calcosol Fast Yellow GL Paste, greener and brighter shades of superior fastness properties are attainable. Attention is directed to the extraordinary light fastness of Calcosol Fast Yellow GL on viscose rayon, both as a self shade and when resin-treated. It is stated that, in addition to the excellent light fastness, Calcosol Fast Yellow GL Paste has excellent all-around fastness properties. Its dyeing characteristics make it applicable to the usual methods of dyeing.

CATIONIC DYES
(Du Pont)
New dyes in this group developed especially for "Orlon"* type 42 acrylic fiber are sold under the trade-mark "Sevron"**. Several of these dyes included in the 1953 Annual Processing Review Number were
"Sevron"** Yellow L (in previous issue as Du Pont Basic Yellow OL)
"Sevron"** Brilliant Red 4G (in previous issue as Du Pont Basic Red 4G)
"Sevron"** Blue B (in previous issue as Du Pont Basic Blue OB)
Several more have recently been announced which are described in their alphabetical order.

* Registered Trade-name
** Trade-mark

"CELANTHRENE"* BRILLIANT BLUE FR CONC.
(Du Pont)
A disperse dye which is redder and duller in shade and is more economical for certain uses than "Celanthrene" Brilliant Blue FFS Conc 200%. It is chiefly recommended where equal fastness to the FFS type is required and where

* Registered Trade-mark

the green and bright shade of the FFS is not necessary. An added advantage of "Celanthrene"* Brilliant Blue FR Conc. over the older product is its ability to build up better when dyeing at 160°F. It is suitable for dyeing acetate, nylon and "Orlon"* type 42 acrylic fiber by recommended procedures. It has been successfully employed in the dyeing of nylon hosiery, synthetic fiber dress materials, decorative fabrics and blends of the fibers mentioned. "Celanthrene"* Brilliant Blue FR Conc. is said to disperse readily, penetrate and exhaust well and can be applied in any of the usual dyeing equipment since brass and iron do not affect the shade or dyeing properties.

CELLITON* BLACK EH
(General Dyestuff)

A disperse dyestuff recommended especially for dyeing rich jet-black shades on acetate of good (6) light fastness when economy and very good affinity at 160 as well as at 190°F. are required. Fair-to-good (2-3) fastness to acid perspiration, very good (4) fastness to alkaline perspiration and excellent (5) resistance to chlorinated solvents and hot pressing (5) are claimed as desirable for general clothing uses. Dyeings of this black are not dischargeable (2) and they are poor-to-fair (1-2) in resistance to atmospheric fading. Rayon and cotton are only slightly stained (4-5) in dyeing.

* Registered Trade-mark

CELLITON* BLUE GAFD
(General Dyestuff)

A new disperse dyestuff for dyeing bright greenish-blue shades on acetate, which are outstanding in dischargeability. This new product is distinctly greener and brighter in shade than Celliton Blue BGF Extra and has the important advantage of giving much better money value for jig application because of its property of building up much better at lower temperatures. In general fastness properties the new Celliton Blue GAFD equals Celliton Blue BGF Extra, that is, it is much faster to gas fading than most other disperse blues and has the advantage of fading to the green rather than to the red side. Though not quite so fast to light as the blues that are less fast to gas fading, it still displays good (5) light fastness in full shades.

* Registered Trade-mark

CELLITON* FAST BLUE LAFR
(General Dyestuff)

A new, straight, disperse dyestuff, which is outstanding among bright blues for acetate in that it is claimed to have very-good-to-excellent (4-5) resistance to atmospheric gas fading, and the slight fading that does occur is in tone rather than to the red side. It is also said to have very good fastness to sunlight on acetate, and very good to excellent (4, 4-5, or 5) fastness to perspiration, fresh water, swimming-pool water, salt water, hot pressing, dry cleaning, and sublimation. Celliton Fast Blue LAFR is especially recommended for dyeing Dacron polyester fiber by the usual methods, on which it is said to be distinctly faster to light than on acetate, and to have very much better wet fastness.

* Registered Trade-mark

CELLITON* FAST RED VIOLET DAC
(General Dyestuff)

A new disperse dyestuff especially recommended for dyeing shades of outstanding fastness properties on Dacron polyester fiber, which may be applied with either benzoic acid or orthophenylphenol as the carrier near the boil, or without a carrier at 250°F. It is particularly recommended for fast suiting shades, Celliton Fast Blue LAFR being an excellent companion dyestuff for combinations. The fastness to light is very-good-to-excellent (6-7) and the fastness to sublimation, excellent.

* Registered Trade-mark

CHLORANTINE ® FAST GREY NGLL
(Ciba)

Is recommended for dyeing knitting yarns, knitted goods, dress materials and furnishing fabrics. Its fastness to wet treatments can be improved by aftertreatment with Coprantex B. It is also suitable for direct printing. Because it is readily soluble and not affected by metals, it is well suited for application in circulation machines.

® Registered Trade-mark

CHROMAVEN* BLACK BLUE G
(American Aniline)

This new addition to this corporation's line of chrome colors is said to be rated as excellent to light and wet processing. It is claimed that it is particularly useful in combination shades where end use requirements demand exceptional fastness properties. The new US Army Grey-Green Shade No. 44 which specifies Chrome Black Blue G as one of the components is an example of a typical combination shade. This color is reported to be a very level dyeing readily soluble color.

* Reg U S Pat Off

CHROMAVEN* FLAVINE RA
(American Aniline)

A homogeneous chrome color said to possess outstanding fastness which comprises one of the components of the new US Army Grey-Green Shade No. 44. This yellow dye is recommended by the manufacturers for both wool and nylon whenever outstanding fastness properties are a requirement. It is stated that Chromaven Flavine RA is rated as 6-7 in fastness to light, 5 in fastness to fulling, 4-5 in fastness to washing at 120°F. and 4-5 in fastness to decating.

* Reg U S Pat Off

CHROME BRILLIANT RED BL
(Progressive)

This is claimed to be the brightest chrome red available. It is said to have excellent wet fastness properties and to be very fast to light. It is stated that there is no better way of improving the brilliance of a red shade with superior fastness properties.

CIBANONE ® BLACK DM DOUBLE PASTE
(Ciba)

An economical direct dyeing vat black especially suited for package and continuous dyeing.

® Registered Trade-mark

CIBALAN ® BLUE 3GL
(Ciba)

It is stated that the very good exhaustion, high fastness to light and very good fastness to perspiration as well as the fact that tippy wool is tone-in-tone dyed make this a very good addition to the Cibalan range.

® Registered Trade-mark

CIBALAN ® BRILLIANT YELLOW 3GL
(Ciba)

Is the brightest color of this series. It is said to have very good fastness to light and to be particularly suited for dyeing wool-nylon unions.

® Registered Trade-mark

CIBALAN ® CORINTH BL
(Ciba)

Is an economical color which can be used in combination with other Cibalan ® products to produce a black.

® Registered Trade-mark

CIBALAN ® GREEN GL
(Ciba)

Is a premetallized dyestuff which is said to possess very good fastness to light, excellent fastness to water and washing, and excellent fastness to perspiration, sulfur stoving, alkali soda (10%), acid milling, and fulling.

® Registered Trade-mark

CIBANONE ® GREY LN PASTE
(Ciba)

Especially developed for continuous dyeing. Cibanone Grey LN Paste is said to be exceptionally fast to water spotting in addition to possessing good all-round fastness properties.

® Registered Trade-mark

CUPROPHENYL* VIOLET 3RL (Patented)
(Geigy)

The newest addition to the series of substantive azo colors for viscose rayon, cuprammonium rayon and cotton introduced a few years ago under the trade name Cuprophenyl. Cuprophenyl Violet 3RL like the earlier members of the range combines simplicity of application with outstanding all around fastness. It is stated that it can be applied as an ordinary direct color with a simple aftertreatment of copper sulfate and acetic acid at low temperature to obtain extremely high resistance to light and washing. It is also possible to aftertreat the Cuprophenyls with Gycofix 67 (or Gycofix 67 in conjunction with the UF resin) rather than the copper sulfate and acetic, and by so doing obtain a further increase in all around fastness. The entire range of Cuprophenyls are well adapted for subsequent finishing with urea formaldehyde resin which only minorly affects the shade or fastness properties.

* Registered Trade-mark

DIAMOND BROWN B
(General Dyestuff)

A new straight acid dyestuff containing complex-bound chromium, which is recommended as a penetrating color for chrome-tanned leather where full uniform penetration is desired. It gives medium, purplish browns, and is thus especially suitable as an economical penetrating component for dark and medium shades of brown on all chrome grain and suede stock.

DIAZAMINE FAST RED BWL
(Sandoz)

A new addition to the Sandoz line of Developed colors which are said to be distinguished by their improved light fastness over older types as well as having good fastness to washing and perspiration. The new product has a rich bright shade and should prove useful for dyeing yarns in beams or packages or for knitted fabrics. The color is also reported satisfactory for discharge work, particularly on rayon. It also stands aftertreatment with urea-formaldehyde after which its light fastness is improved.

DIAZAMINE FAST SCARLET RWL Pat
(Sandoz)

The manufacturer claims this new type to exceed all other developed scarlets in brilliancy of shade, with the exception of their Diazamine Fast Scarlet GL and GLA which are considerably yellower in shade. Like the GL, GLA and other colors in their "Fast" developed line, the new product is reported to have outstanding light fastness for a developed color. Its fastness to washing and perspiration is also very good, and dischargeability is rated excellent. The color is adaptable to urea-formaldehyde treatment which further improves its light fastness.

DIAZANIL* ORANGE RR CONC
(General Dyestuff)

A straight diazotizable direct dyestuff, which gives bright reddish-orange shades on cotton and rayon when developed with beta naphthol or ready-to-use Developer AMS-CF. Developed self or combination shades made with this dyestuff are recommended where good (3) fastness to washing and economy of dyeing are of first consideration. The fastness to light is said to be fair (3) on cotton and fairly good (4) on rayon, while the ratings for perspiration, dry or wet crocking, hot pressing, and spotting with dilute hydrochloric acid or conc ammonia water are all excellent (5). A further advantage of such developed dyeing is that they are unaffected in shade or light fastness by urea- or melamine-formaldehyde resin finishing.

* Registered Trade-mark

DIAZOPHENYL* FAST GREEN GLN SUPRA
(Geigy)

It is said that this new product is among the brightest fast to light developed greens with characteristic wash fastness to be offered. The new color can be used in combination with the yellower, duller Diazophenyl Fast Green 2GL Supra to produce a variety of fast to light developed green shades which will reserve acetate and be well adapted for discharge. The manufacturer especially recommends the new dyestuff as a ground shade for rayon or cotton dress goods and also for the cotton knit goods trade.

* Registered Trade-mark

DIORLENE ® BRILLIANT RED 3B
DIORLENE ® BLUE 5G
(Ciba)

"Fast to light" and "fast to washing" shades on Orlon 42. In addition, both colors are said to have excellent fastness to perspiration, crocking, carbonizing and hot pressing.

® Registered Trade-mark

DIPHENYL FAST ORANGE GRW
(Pat applied for)
(Geigy)

A direct color, said to possess outstanding wash fastness, this new dyestuff produces extremely bright red shades of orange on cotton and on rayon. In addition to its excellent wash wastness this new dyestuff is claimed to have good resistance to water bleeding and perspiration, excellent discharge properties both alkaline and neutral, to exhaust well with moderate amounts of salt and to possess good solubility. It is said to be particularly well adapted for the dyeing of ground shades on rayon dress fabrics subsequently to be discharged. For this purpose it is said to be preferred over diazotized and developed oranges since it approaches that class of colors in wash fastness when dyed direct without any aftertreatment and consequently offers considerable savings in labor and equipment time. Further, although its light fastness is not outstanding, it is said to be better in this respect than most dischargeable developed oranges. Companion colors offered in the past by the same manufacturer are Diphenyl Red RW, Diphenyl Brilliant Green G and Diphenyl Brilliant Green 5GW.

DIRECT DARK GREEN BLT
(Ciba)

Is an economical low temperature dyeing product with good build up for use in the paper trade.

DRESSING BLACK SSG CONC
(General Dyestuff)

An anionic-type dyestuff recommended for the spray and brush dyeing of both vegetable- and chrome-tanned leather and for the coloring of liquid shoe dressings and polishes. It is said to produce full, rich, bluish blacks free from bronziness in spite of great depth of color when sprayed or brushed at a concentration of 4 oz per gallon. The best spreading and leveling effect with this dyestuff is obtained in applica-

tion in the presence of 4 oz of Igepal CO-633 and 4 oz of Emulphor EL-719 per gallon of solution. Excellent solubility is claimed as important to the success of this dyestuff in shoe dressings and polishes.

DU PONT ANTHRAQUINONE GREEN 4G
(Du Pont)
An acid dye recommended for use in the continuous dyeing of wool rawstock. It produces bright, yellow shades of green on both wool and nylon with best results obtained on wool by using Glauber's salt and acetic acid, and on nylon by using acetic acid. The color has good affinity for wool by neutral methods provided Glauber's salt is used in the dyebath. Du Pont Anthraquinone Green 4G changes trace to noticeably duller in shade on chroming, and becomes much yellower and noticeably brighter in shade when exposed in artificial light.

DUROFAST NAVY RP
(Berkshire)
This product yields navy blue shades said to be of excellent fastness to light and excellent fastness to washing when aftertreated with resin and copper complex. The shade is only slightly affected by these treatments. Acetate affects are unstained. It is stated that this product is not salt sensitive and is one of the most level dyeing types among the fast direct blues available at the present time.

DUROFAST ORANGE GLFC
(Berkshire)
Claimed to be one of the fastest to light direct oranges which is not impaired by resin treatment. It is said to have outstanding fastness to washing when treated with resin and copper complex. These treatments have very little effect on the shade. In addition to its excellent dyeing properties this product leaves acetate and nylon white.

DUROFAST RED 7BLN
(Berkshire)
Pr 246

DUROFAST RED RLN
(Berkshire)
A new level dyeing direct fast to light red—also said to be of good fastness to washing. Suitable for resin aftertreatments, can also be used with copper complexing agents for fastness to washing @ 160°F. Acetate effects are left white.

DUROFAST RUBINE BLN
(Berkshire)
This product is only a trace yellower than Rubine 3BLL types over which it has the advantage of much better exhausting property. It is stated that it has very good fastness to light with or without aftertreatment with resin and copper complex. Fastness to washing is said to be excellent on resin and copper complex treated fabrics. Acetate and nylon effects are unstained.

DUROFAST YELLOW RLFC
(Berkshire)
A reddish shade of yellow said to be of very good fastness to light and excellent fastness to washing when treated with resin and copper complex. Leaves acetate and nylon white. It is stated that it does not migrate, an objection which is common with many direct yellows of similar shade.

FAST BLACK SALT ANS
(General Dyestuff)
A stabilized fast color salt, recommended for printing or continuously developing economical neutral black shades on cotton or rayon padded with Naphtol AS, AS-D, and AS-BS. These rich black shades are claimed to display not only very good fastness to severe washing and chlorine, and medium fastness to light but also very good dischargeability. A further important advantage of these blacks is suitability for resin finishing without loss of light fastness or change of shade. The black resulting from combination with the Naphtol AS-BS is considerably better than the other two in dischargeability and is half a rating better in fastness to light and fastness to washing. Furthermore, although Naphtol AS-BS is not usually recommended for yarn work, it is practical to apply Naphtol AS-BS on yarn in circulating machines with salt and to couple with Fast Black Salt ANS for the production of economical blacks of excellent (5) fastness to washing.

FAST BLACK SALT ANS
(Progressive)
A new color salt for both printers and dyers. It prints on naphthol preparations a very good neutral black which is said to be fast to washing and chlorine. It provides also a reliable method of continuous dyeing of black shades on piece goods, especially with Naphtol AS-BS. It is stated that such dyeings are very good for white discharge prints and do not tender materials finished with melamine-formaldehyde resins.

FAST BORDEAUX SALT OL (Patented)
(Progressive)
Claimed to be the only color salt that produces bordeaux shades on yarns fast to peroxide. Especially Naphtol AS-BI is suited for the purpose.

FAST GOLDEN ORANGE SALT GR
(Progressive)
Produces golden orange shades on Naphtol-AS which are said to possess good fastness to light also in light shades.

FAST NAVY BLUE SALT R
(General Dyestuff)
A stabilized diazotized base recommended for the economical production of very fast dark-blue and navy shades of various tones on cellulosic textiles in different stages of manufacture that have been naphtholated with one of several substantive naphthols, including Naphtol AS-SW, AS-TR, AS-BO, AS-ITR, AS-LC, and AS-E. The fastness to light of all these shades in full depth is said to be generally excellent, as is also the fastness to severe washing. The properties of fastness to chlorine, mercerization, plissé finishing and peroxide bleaching for all these combinations are claimed to be very good. This product is therefore useful for textiles for which the fastness requirements are high. This particular fast color salt is characterized by quickness of coupling and some affinity for cellulose.

FAST NAVY BLUE SALT RA
(Progressive)
Said to produce fast to light navy shades on various naphthols. In contradistinction to Fast Dark Blue Salt R the new type can not only be used for continuous dyeing but also for package and jig dyeing.

FAST ORANGE GR SALT
(American Aniline)
This new Amanil* Fast Color Salt is said to be one of excellent substantivity and may be coupled with most of the Amanil Napthol line to produce attractive and serviceable shades which possess good to excellent fastness properties. As coupled with Amanil Napthol AS-SR and Amanil Napthol AS-SG it produces a desirable shade of black with a light fastness rating of 7. This product may be applied in package machines, jigs, becks and continuous equipment.

* Reg U S Pat Off

FAST ORANGE SALT LG
(Progressive)
Produces various fast to light orange shades of exceptional brilliance.

FAST ORANGE RD SALT
(American Aniline)
This new and highly stabilized Amanil* Fast Color Salt is claimed to be quite superior in its field for the production of yellows, oranges, tans, and browns. These shades are said to offer high fastness to light, washing, hot pressing and chlorine. For example, as coupled with Amanil Napthol AS-L4G a bright reddish yellow is produced with a light rating of 7 to 8 and excellent peroxide fastness.

* Reg U S Pat Off

FAST RED KL BASE (Patented)
(Progressive)
Produces fast to light pinks and reds insoluble in plasticizers for resin coating on cotton piece goods.

FAST RED SALT FG, FR AND GTR
(Progressive)
Produce on several naphthols bright, fast to light reds and pinks.

FAST SCARLET SALT AFA (Patented)
(Progressive)
Makes it possible to obtain on the same prepare with the new Naphtol AS-AG and Naphtol AS-IRG brilliant yellow, scarlet, pink, bordeaux, and lilac shades by using Fast Black Salt K and Fast Bordeaux Salt OL.

FAST SCARLET SALT LG
(Progressive)
Said to produce fast to light, brilliant scarlet shades.

FASTUSOL* BLUE L6GA
(General Dyestuff)
A fast-to-light direct blue for cotton and rayon characterized especially by suitability for resin finishing, by very good releveling properties in dyeing, and by an ability to build up well to give blues of great depth of color economically. Full shades, which are bright and rather neutral in tone, are said to display excellent to maximum light fastness, which is still excellent after resin aftertreatment. In dyeing it leaves acetate and the later wholly synthetic fibers clean; nylon is stained only slightly. Dyeings discharge very well (4) with a neutral discharge paste before resin treatment. With resin treatment the fastness to perspiration is reported to become very good (4) and the fastness to washing, good (3, no loss or stain at 120°F).

* Registered Trade-mark

FASTUSOL* BRILLIANT BLUE L8GU
(General Dyestuff)
A new, straight, substantive dyestuff especially recommended for the production of fast-to-light shades on cotton or rayon, particularly where the goods are to receive an anticrease resin finish or acetate effect threads are to be left white. It produces very greenish, bright shades of blue, which are said to have very good (6) fastness to light in full shades on cotton and excellent (7) light fastness on rayon. This fastness to light is claimed to be unaffected by either urea-formaldehyde or melamine-formaldehyde finishes. Dyeings are dischargeable to a good white in light and medium depths of shade (4) with both neutral and alkaline discharge pastes. Excellent (5) fastness to rubbing and hot pressing and very-good-to-excellent (4-5) fastness to perspiration are other outstanding properties of this blue.

* Registered Trade-mark

FASTUSOL* BROWN LBU
(General Dyestuff)
A new fast-to-light direct dyestuff, which is especially recommended for use on materials that are to receive a resin finish inasmuch as the shade is not altered and the fastness to light is not impaired by urea-formaldehyde resin and is only slightly affected by melamine-formaldehyde resin. On cotton, full shades of this dyestuff are said to display excellent (7) fastness to light, and on rayon, excellent-to-maximum (7-8) fastness to light. Another important feature is the property of leaving acetate and the newer synthetic fibers clean (5); nylon is only slightly stained and wool, distinctly (3). This brown is reported to be very good (4) in dischargeability with a neutral discharge paste. In application it displays good solubility, responds normally to salt additions, penetrates well, and exhausts quite well.

* Registered Trade-mark

FASTUSOL* ORANGE L6GU-CF
(General Dyestuff)
A new, bright, yellowish-orange, fast-to-light, direct dyestuff for cotton and rayon, which is especially recommended for fabrics that are to be anticreased. A particular advantage of this orange in comparison with others that are fairly close in shade is very good money value. Full shades are claimed to display good (5) fastness to light on cotton and very-good-to-excellent (6-7) fastness to light on rayon. Upon aftertreatment with urea-formaldehyde resin, the fastness to light is improved to very good (6) on cotton and to excellent-to-maximum (7-8) on rayon; the improvement for melamine-formaldehyde is half as great. This orange leaves acetate effect threads nearly clean (4-5).

* Registered Trade-mark

FASTUSOL* SCARLET LGG-CF
(General Dyestuff)
A new, straight, direct dyestuff for cotton, rayon, linen, and silk, which dyes bright, very yellowish shades of scarlet characterized by excellent light fastness. This is the only direct scarlet recommended by General Dyestuff when a high degree of light fastness must be maintained upon resin aftertreatment. It is said to give shades of equal depth on cotton and rayon, the dyeings of full shades on cotton having good (6) fastness to light and those on rayon, excellent (7) fastness to light. Upon resin aftertreatment the fastness to wasning is slightly improved, while the fastness to light is claimed to be virtually unaffected by urea-formaldehyde resin and to be impaired by only one-half unit by melamine-formaldehyde resin. Both untreated and resin-treated dyeings of this scarlet on cellulosic fibers are asserted to be faster than those of other known direct scarlet to water, washing and perspiration. Dyeings on silk from a bath containing acetic or formic acid are said to be considerably yellower than those on cotton or rayon and approximately equal to those on cotton with respect to light fastness and wet fastness.

* Registered Trade-mark

GENACRYL* YELLOW 5G, YELLOW 3G, ORANGE G, ORANGE R, PINK G, RED 6B, 5B AND BLUE 6G
(General Dyestuff)
A new series of basic-type dyestuffs especially recommended for dyeing shades of exceptional brightness, very good tinctorial value, very good light fastness (the blues are only fairly good) and very good (4, no loss from AATCC Wash Test No. 3) wash fastness on Orlon 42 at the boil without a carrier in the presence of a little acetic acid. Although the older ordinary basic dyestuffs are also applicable on Orlon, they are in general much inferior to the Genacryl

* Registered Trade-mark

basic dyes in light fastness. The Genacryls are applicable on Orlon 81 at 250°F under pressure.

HELIOGEN* BLUE BMP POWDER
HELIOGEN BLUE GMP POWDER
(General Dyestuff)

Straight copper phthalogen pigments with the usual excellent fastness to light, dilute acids and alkalis, which have been especially prepared in resinated form to be soft grinding and quite transparent. They are said to produce strong, clear, bright shades of blue and green, respectively, with much darker fulltones top and considerably more transparency than obtainable with the unresinated Heliogen pigments, but with somewhat less tinctorial strength. They are claimed to be particularly suitable for the production of lithographic and offset printing inks when maximum light fastness and high transparency are required. Soft grinding permits them to be recommended especially for use in paints, for which they can be mixed into most vehicles with little stirring and for which they develop sufficient strength in the usual paint-grinding equipment.

* Registered Trade-mark

HELIOGEN* BLUE BWSN-ND POWDER SPECIAL
(General Dyestuff)

A water-dispersible pigment powder in non-dusting form to meet the demands especially of the paper industry. This new dyestuff is said to be equal in all resects to Heliogen Blue BWSN Powder Special and may be used as a 1:1 substitution for the latter with the advantage of not dusting. It is standardized like the Heliogen Blue BWSN Powder Special without any electrolyte and is therefore recommended for the same uses, namely, for coloring rubber latices, resin-emulsion paints, water paints, and any other water system where electrolytes would interfere.

* Registered Trade-mark

HELIOGEN GREEN GB POWDER
(General Dyestuff)

A new straight copper polychlorophthalogen bluish-green 100%-pigment toner free from electrolytes, which is claimed to be fully 5% stronger than Heliogen Green GA Powder and considerably greener in shade. It may be ground in oil for paints and enamels, in varnish for printing inks, and in plasticizers for use in certain lacquers low in aromatic-solvent content. It produces clean bright shades, which are said to be excellent in fastness to light and heat and in resistance to bleeding in oil, alcohols, petroleum, naphtha and water. It is claimed to contain less than 0.02% of ionizable copper and therefore to be suitable for use in rubber, and is recommended for use in plastics. The oil absorption of this product is 30 lb per 100 lb of pigment.

* Registered Trade-mark

HILTONE PIGMENT COLORS
(Hilton-Davis)

A new line of highly concentrated resin bonded pigment colors developed for the printing of fast colors on cotton and synthetic fibers. Hiltone Colors are said to be noted for their brilliance of shade, their excellent fastness to light, washing, dry cleaning, and crocking. Hiltone Colors are applied from a water-in-oil emulsion of printing viscosity by roller printing machines. After drying the print is cured or aged to give maximum fastness. It is stated that prints obtained with Hiltone are sharp and soft and require no soaping. They may be applied in the same patterns as naphthols, vats, stabilized azoics, and other dyestuffs. Also available are Hiltone LC (Low Crock) Pigment Colors which, in addition to the fastness properties of the regular Hiltone Colors, are said to offer exceptional fastness to crocking. Shades and standards available are:

5-37-T-100	Hiltone Red 2B
5-37-T-110	Hiltone Scarlet G
5-37-T-120	Hiltone Red B
5-37-T-130	Hiltone Red Y
5-37-T-155	Hiltone Violet 3R
5-37-T-202	Hiltone Yellow 2G
5-37-T-312	Hiltone Blue G
5-37-T-325	Hiltone Blue 4G
5-37-T-330	Hiltone Blue 5G
5-37-T-400	Hiltone Green B
5-37-T-510	Hiltone Navy R
5-37-T-605	Hiltone Orange O
5-37-T-700	Hiltone Black K
5-38-T-118	Hiltone Red YLC
5-38-T-125	Hiltone Red BLC
5-38-T-220	Hiltone Yellow 2GLC
5-38-T-310	Hiltone Blue GLC
5-38-T-325	Hiltone Blue 4GLC
5-38-T-330	Hiltone Blue 5GLC
5-38-T-410	Hiltone Green BLC
5-38-T-510	Hiltone Navy RLC
5-38-T-608	Hiltone Orange OLC
5-38-T-705	Hiltone Grey 2BLC
5-38-T-710	Hiltone Black KLC

* Registered Trade-mark

IMPAC ACETATE PIGMENT DISPERSIONS
(Imperial)

Impacs are soft, dry powders consisting of 50% pigment dispersed in cellulose acetate They can be supplied with almost any pigment desired as well as in various grades of cellulose acetate. Controlled particle size is said to permit excellent dispersion in acetate-acetone dope which can then be spun directly to yield uniform, highly colored fabrics. Also adaptable to the spin dyeing of other synthetic resins with which cellulose acetate is compatible.

IMPAC	MONARCH BLUE	D-100
IMPAC	MONARCH GREEN	D-101
IMPAC	HANSA YELLOW R	D-102
IMPAC	HORICON YELLOW	D-103
IMPAC	IROQUOIS YELLOW	D-104
IMPAC	PRIMROSE CADMIUM YELLOW	D-105
IMPAC	MONTEREY RED	D-106
IMPAC	MADDER LAKE RED	D-107
IMPAC	CHIPPEWA GREEN	D-108
IMPAC	JET BLACK	D-109
IMPAC	MARCY RED	D-110
IMPAC	MAJESTIC YELLOW	D-111
IMPAC	BENZIDINE YELLOW	D-112
IMPAC	REVERE RED	D-113
IMPAC	GOLDEN CADMIUM YELLOW	D-114
IMPAC	DEEP CADMIUM ORANGE	D-115
IMPAC	LIGHT CADMIUM RED	D-116
IMPAC	REX ORANGE	D-117
IMPAC	LIGHT CHROME YELLOW	D-118
IMPAC	MEDIUM CHROME YELLOW	D-119
IMPAS	DIANISIDINE BLUE	D-120

"IMPAD" PIGMENT PAD DYEING CONCENTRATES
(Imperial)

The Impad products* are highly dispersed pigments specially stabilized for use with aqueous binders for the pad dyeing of fabrics. They have been primarily designed for use with Imperial's T-106 resin (melamine type) and with such are said to produce very level, bright, lightfast, economical dyeings, characterized by excellent crock and washfastness and freedom from migration. These products are suitable for use on cotton, nylon, Orlon, Dacron, or glass. They have the advantage of flexibility as they can be used with regular urea formaldehyde finishes in place of the T-106 binder. As they are completely aqueous in nature with no oil phase, they are stable to mechanical agitation with no danger of flushing. The following products are now being offered:

IMPAD	MONARCH BLUE	T-220
IMPAD	BENZIDINE YELLOW	T-221
IMPAD	MONARCH GREEN	T-222
IMPAD	REVERE SCARLET	T-223
IMPAD	MALTA RED (BLUE SHADE)	T-224
IMPAD	OSWEGO ORANGE	T-225
IMPAD	BLACK	T-226
IMPAD	JET BLACK	T-227
IMPAD	CHROME YELLOW	T-231
IMPAD	PIGMENT GREEN B	T-232
IMPAD	INDIA RED	T-233
IMPAD	MAJESTIC YELLOW	T-234
IMPAD	MARCH RED	T-235
	MELAMINE RESIN	T-106

* U S Patent 2,614,086

IMPERSE AQUEOUS PIGMENT DISPERSIONS
(Imperial)

The Imperse series of aqueous pigment dispersions encompass pigments especially selected for textile applications. These dispersions contain 20% pigment and are carefully standardized for strength and hue. An important characteristic of these products is their very small and uniform particle size. Available either with a nonionic or anionic dispersing agent, they are said to represent an excellent color source for textile printing and dyeing systems.

Anionic		*Nonionic*
X-2345	IMPERSE MONARCH BLUE	X-2446
X-2521	IMPERSE MONARCH BLUE G	X-2537
X-2586	IMPERSE BENZIDINE YELLOW	X-2453
X-2346	IMPERSE MONARCH GREEN	X-2454
X-2374	IMPERSE OSWEGO ORANGE	X-2457
X-2354	IMPERSE REVERE RED	X-2455
X-2355	IMPERSE MALTA RED	X-2456
X-2621	IMPERSE MARCY RED	X-2622
X-2610	IMPERSE MAJESTIC YELLOW	X-2611
X-2378	IMPERSE CHIPPEWA GREEN	X-2459

IMPRINT PIGMENT PRINTING CONCENTRATES
(Imperial)

Imprint Pigment Printing Concentrates are a combination of a finely dispersed pigment and a binder system based on water-soluble cationic resin.* Advantages claimed include absence of pick-off on hot calendering, ease of cleaning from equipment, freedom from inflammable solvent prints with Aniline Black, Rapidogens, etc., better color value and wash resistance on naphtholated cloth (salt colors) and generally improved crock resistance, particularly in deeper shades. Particularly adapted to plissé work since the printed areas do not present a caustic resist. The Imprints can be used alone or in conjunction with the regular emulsion types. No special equipment is necessary, since these products were designed to function under the processing conditions generally prevailing in the textile industry.

* U S Patent #2,616,861

IMPRINT	BLUE	T-200
IMPRINT	YELLOW	T-201
IMPRINT	GREEN	T-202
IMPRINT	SCARLET	T-203
IMPRINT	RED	T-204
IMPRINT	ORANGE	T-205
IMPRINT	BLACK	T-206
IMPRINT	JET BLACK	T-207
IMPRINT	MAROON	T-208
IMPRINT	WHITE	T-210
IMPRINT	GREEN B	T-211
IMPRINT	RED	T-212
IMPRINT	VIOLET	T-213

INDANTHRENE* BLUE CGKWP EXTRA CONC POWDER
(General Dyestuff)

A new, straight, anthraquinone-type, vat dyestuff characterized especially by excellent (5) fastness to chlorine and very good level-dyeing properties. The shade is said to be distinctly greener and brighter than that of Indanthrene Blue CLNWP Powder, but the fastness properties are claimed to be essentially the same. For example, both are said to display very-good-to-excellent (4-5) fastness to severe washing, very-good-to-excellent (6-7) fastness to light in full shades, and excellent (5) fastness to mercerization and plissé. The new dyestuff further resembles the CLN brand in level dyeing but is best dyed by the IK method, whereas the CLN dyes best by the IW method. Both are again alike, however, in that they may be dyed successfully by all three methods, that is IK, IW, or IN. Indanthrene Blue CGKWP Extra Conc Powder is claimed to be especially suitable for application in circulating machines, and also, because of excellent dispersibility (WP in the name), to be suitable for pigment padding. The designation "Extra Conc Powder" means that it is several times stronger than a single paste.

* Registered Trade-mark

INDANTHRENE* BRILLIANT ORANGE GR SUPRAFIX
(General Dyestuff)

A straight vat dyestuff in the form of a slightly viscous but free-flowing, nonsettling, speck-free, nondrying paste recommended for the screen and roller printing of cottons and rayons. It is said to be characterized especially by brilliance of shade and excellence of fastness properties. Full shades are claimed to possess very-good-to-excellent (6-7) light fastness and very-good-to-excellent (4-5) fastness to severe washing (AATCC Wash Test #4) and to 0.3% chlorine solution. It is therefore suitable for such diverse textiles as table linen, washable dress goods, and draperies.

* Registered Trade-mark

INDANTHRENE* BROWN GL PASTE
(General Dyestuff)

An anthraquinone vat dyestuff recommended for dyeing rich brown shades of outstanding fastness properties and economy. Full shades are claimed to display maximum (8) fastness to light, excellent (5) fastness to severe washing, hot pressing, and dry rubbing, and very-good-to-excellent (4-5) fastness to chlorine, peroxide bleaching, water spotting, mercerization, and plissé finishing. It is said to be in well-dispersed paste form especially suitable for pigment padding and for circulation as pigment before reduction in circulating machines. It is also recommended for application in the form of the vat acid. It is best dyed by the IW method but may also be dyed by the IK method. The leuco is sufficiently resistant to high temperature and overreduction that this dyestuff is recommended for application by the pad-steam, hot-oil, and molten-metal methods.

* Registered Trade-mark

INDANTHRENE* BROWN GLWP POWDER
(General Dyestuff)

The recently developed Indanthrene Brown GL Paste has been so successful that this vat dyestuff for dyeing cellulosic textiles is now being brought out in the form of a dispersible powder of twice the strength of the paste. The new WP Powder brand readily gives a dispersion in water that is equal to the paste brand for those application methods for which the paste is especially recommended: namely, pigment padding and circulation as pigment before reduction in circulating dyeing machines. In these applications the new powder brand exhibits the same working properties as the paste brand, that is, freedom from specks, readiness of reduction, resistance to overreduction so as to be suitable for high-temperature continuous methods, and excellence of level dyeing. Dyeings of this brown are claimed to display maximum (8) light fastness in medium and heavy depths, excellent (5) fastness to severe washing and hot pressing and very-good-to-excellent (4-5) fastness to 0.3%-active-chlorine solution.

* Registered Trade-mark

INDANTHRENE* DARK BROWN MR PASTE AND MRWP EXTRA CONC POWDER
(General Dyestuff)

A vat dye appearing in the form of a well-dispersed paste and of a three-times-stronger dispersible powder, both of which are said to give pigment dispersions recommended for pigment padding and for circulation in circulating machines. It dyes rich brown shades of exceptional economy, which are claimed to display excellent-to-maximum (7-8) fastness to light in medium to heavy dyeings and excellent (7) light fastness in light shades. Such dyeings are said to have excellent (5) fastness to hot pressing and water spotting and very-good-to-excellent (4-5) fastness to washing, chlorine bleaching, peroxide bleaching, mercerizing and plissé finishing. As a consequence of fastness ratings of such a high quality this product is recommended for washable or decorative fabrics where the demands for fastness are high. This brown is best reduced and dyed by the IW method and is recommended for all continuous procedures, the usual addition of yellow dextrine being suggested when there is any tendency to overreduction. Indanthrene Dark Brown MR is especially recommended for application as the leuco vat acid.

* Registered Trade-mark

INDANTHRENE* GREY GG DOUBLE PASTE
(General Dyestuff)

A new, straight, anthraquinone vat dyestuff for dyeing greenish-blue greys of generally excellent fastness properties on cellulosic fabrics. The fastness to light of this grey is said to be excellent (7) for full and medium shades and very-good-to-excellent (6-7) for light greys, or satisfactory for draperies, upholstery, and military fabrics. The fastness to AATCC Wash Test #4 and the fastness to 0.3%-active-chlorine solution are claimed to be very-good-to-excellent (4-5), and the properties of fastness to peroxide bleaching, mercerization, plissé printing, hot pressing, and dry cleaning with chlorinated solvents, all excellent (5). This dyestuff is said to be suitable for circulation as a pigment before reduction in circulating machines, application as a vat acid, and development on pigment-padded goods on Williams and pad-steam ranges.

* Registered Trade-mark

INDANTHRENE* GREY GNF PASTE
(General Dyestuff)

A new, straight, anthraquinone-type vat dyestuff for dyeing fast greys on cotton, linen, and rayon. It is in the form of a dispersed pigment designed for pigment padding and for circulation before reduction in circulating machines. It is reduced and dyed by the IN method but also dyes well in combination with IW dyestuffs. It is claimed to exhaust more slowly and evenly without a retarding agent than any other available vat greys or blacks and is therefore said to be especially suitable for circulation in circulating and other dyeing machines after reduction either inside or outside the machine. The bright blue-grey shades produced with this dyestuff are asserted to display very good (6) to very-good-to-excellent (6-7) fastness to light according to the depth of the grey shade. The fastness to AATCC Wash Test #4 and to chlorine are both very good (4), or adequate for severe use, and the ratings for fastness to hot pressing, peroxide bleaching, mercerizing, and water spotting are all very-good-to-excellent (4-5). A further advantage of this grey is excellent maintenance of shade in artificial light.

* Registered Trade-mark

INDANTHRENE* NAVY BLUE B PASTE
(General Dyestuff)

An anthraquinone vat dyestuff recommended for dyeing and printing either light or very deep navy shades of great economy and fastness. Colorings in full depth are said to have maximum (8) light fastness, excellent resistance to 200 hours' exposure in a Weather-Ometer, and very-good-to-excellent (4-5) resistance to severe washing, chlorine, and peroxide bleaching. Even in light shades the resistance of this blue to light is claimed to be very-good-to-excellent (6-7). Since the shade tends to go slightly redder with oxidizing agents, it is useful in shading fast vat blues that tend to go greener upon treatment with chlorine or peroxide. Very good (4) resistance to mercerization and plissé is another important property. This dyestuff is best dyed in the reduced state by the IN method in the presence of a little retarding agent. The paste is recommended for circulation through yarn before reduction or for pigment padding, and the leuco is sufficiently resistant to overreduction to be developed by pad-steam and hot-oil methods. This blue may also be applied as the vat acid.

* Registered Trade-mark

INTERCHEM® ACETATE BLUE GSF
(Interchemical)

A new highly dispersed acetate dye developed specifically to provide a high degree of fastness to both gas fading and sunlight on acetate. In addition, it also is said to provide good fastness to washing, drycleaning, and sublimation. It is useful as a self-shade and in combination with other Interchem Acetate GSF dyes for producing compound shades requiring a high degree of fastness. This dye can be applied either on jigs or boxes at temperatures from 160-190°F. The color yield is particularly good at 185°F or higher. Interchem Acetate Blue GSF is said to possess good exhaustion, pile on, and level dyeing properties and also possesses good stability in both alkaline and acid dye baths. It is suitable for application printing, but is not dischargeable. Although Interchem Acetate Blue GSF was developed specifically for application to acetate, it is also an outstanding color for dyeing Dacron, and can be employed for dyeing nylon and Dynel.

INTERCHEM® ACETATE BLUE RBN
(Interchemical)

A new highly dispersed acetate dye for dyeing bright royal blue shades on acetate. When dyed on nylon, the shades are slightly duller. In medium and dark shades it is said to provide good fastness to light and washing. This dye can be employed as a self-shade and as the blue component for producing compound shades, including greens, navies, and browns. It can be applied either on jigs or boxes at temperatures from 160-190°F. The color yield is particularly good at 185°F or higher. Interchem Acetate Blue RBN is said to be an important all-round color. It can also be employed for dyeing Dacron and Dynel.

INTERCHEM® ACETATE RED GSF
(Interchemical)

A new highly dispersed acetate dye developed specifically to provide excellent fastness to both gas fading and sunlight on acetate. In addition, it also is said to provide excellent fastness to washing, drycleaning, and sublimation. It is useful as a self-shade and in combinations with other Interchem Acetate GSF dyes for producing compound shades requiring a high degree of fastness. This dye can be applied either on jigs or boxes at temperatures from 160-190°F. The color yield is particularly good at 185°F or higher, with good exhaustion, pile on, and level dyeing properties. When diazotized and developed with Developer BONA, it does not change shade. It is suitable for both application and discharge printing in all depths of shade. It is said to have excellent dischargeability. Although Interchem Acetate Red GSF was developed specifically for application to acetate, it can be employed also for dyeing nylon, Dacron, and Dynel.

INTERCHEM® ACETATE SCARLET GSF
(Interchemical)

A new highly dispersed acetate dye developed specifically to provide excellent fastness to both gas fading and sunlight on acetate. In addition, it also is said to provide excellent fastness to washing, drycleaning, and sublimation. It is useful as a self-shade for producing bright scarlets or pinks and in combinations with other Interchem Acetate GSF dyes for producing compound shades requiring a high degree of fastness. This dye can be applied either on jigs or boxes at temperatures from 170-190°F. The color yield is particularly good at 185°F or higher, with good exhaustion, pile on, and level dyeing properties. When diazotized and developed with Developer BONA, it turns very slightly yellower. It is suitable for application printing in all depths of shade and for discharge printing in medium and light shades. Although Interchem Acetate Scarlet GSF was developed specifically for application to acetate, it is suitable also for dyeing Dynel, and can be employed for dyeing nylon and Dacron.

INTERCHEM® YELLOW 4RL-SN
(Interchemical)

A new highly dispersed acetate dye developed specifically for dyeing Dacron and nylon. When dyed on Dacron, is is said to withstand 170 hours Fade-Ometer exposure without appreciable fading. On nylon, the lightfastness is 30 hours. It does not change shade after washing on either of these fibers. Interchem Yellow 4RL-SN is useful as a self-shade for producing bright yellows and in blends with other Interchem Acetate Dyes for producing compound shades, including greens, tans, browns, and grays. Dyeing is carried out by conventional methods. The optimum temperature range for dyeing on jigs or boxes is from 180-200°F. The color yield is particularly good at 190°F or higher, with excellent exhaustion, pile on, and level dyeing properties. Interchem Yelow 4RL-SN is suitable also for application and discharge printing. It is said to have excellent dischargeability.

IRGALAN* RUBINE RL—Patented
IRGALAN* DARK BROWN 5R—Patented
IRGALAN* BROWN 7RL—Patented
IRGALAN* BLUE GL—Patented
IRGALAN* VIOLET 5RL—Patented
(Geigy)

* Registered Trade-mark

The Irgalan range of colors has been expanded by the addition of the above products. These new types are said to possess the same extremely high all around fastness properties of the previous colors in the series, and are said to approach or exceed in this respect the fastest wool colors used heretofore. The manufacturer also states that, not only do these new additions possess almost the identical fastness properties of the preceding Irgalans, but they draw and work exactly alike as the older colors and with each other, thus enabling the dyer to use them in combination like a homogeneous dyestuff. It is further said that the same evenly penetrated, level results are obtained with these new colors on all types of woolen yarns and piece goods. They are also well adapted for use on spun and filament nylon and on real silk, having the same high quality fastness on these fibers as on wool.

IRGANOL* YELLOW 5GLS
(Patent applied for)
(Geigy)

The latest addition to the "Irganol" range—a group of colors introduced a few years ago by this manufacturer. These dyestuffs are, generally speaking, said to be faster to light than the well known "Polar" series and to draw much better from a neutral bath. This new yellow, in fact, is reported as exhausting almost 100% when dyed neutral on wool, silk or nylon. Irganol Yellow 5GLS produces a bright greenish shade of yellow and is said to have exceptionally good light fastness and good resistance to fulling, and the ability to withstand a chrome bath in the same manner as the Polar colors. It is also said that Irganol Yellow 5GLS is also outstanding for its ability to cover tippy wool uniformly. It is the feeling of the manufacturer that this new range should prove very useful for the dyeing of slubbing, raw stock and union goods where the end requirements call for extremely good light and wet fastness. Irganol Yellow 5GLS is also said to be well adapted for the dyeing of spun or filament nylon, either raw stock or piece goods, with the same good fastness that is obtained on wool.

"LATYL"* BLUE FL
(Du Pont)

A disperse dye which is a green shade of blue, builds up well and is said to have very good light and wet fastness properties on "Dacron"* polyester fiber. It is of interest as a shading component in the production of medium gray, tan and brown shades and especially in shades where more than 2.5% of blue is required. "Latyl" Blue FL changes greener and duller in shade in artificial light. It can be applied to "Dacron"* from aqueous carrier baths, by pressure dyeing without a carrier and by the Thermosol process. Orthophenylphenol is the most commercially useful carrier in the aqueous dyeing of "Latyl" Blue FL and contributes toward levelly-dyed shades having good light fastness. After dyeing, the material should be scoured for 15 minutes at the boil with alkali and "Duponol"* RA surface active agent to remove some excess carrier. Although "Latyl"* Blue FL does not build up in deep shades on acetate, it can be used in both light and medium shades requiring good light, washing and gas-fume fastness. Medium and heavy shades of "Latyl"* Blue FL on 50/50 blends of "Dacron"* and wool produce a stain on the wool; however, the staining does not have a serious effect on wool fastness in light shades.

* Registered Trade-mark

"LATYL"* BRILLIANT BLUE BG
(Du Pont)

A disperse dye which produces full, bright blue shades on "Dacron"* polyester fiber and is redder in shade than "Latyl"* Brilliant Blue 2G. It also has superior build-up properties, permitting full shades on "Dacron"* as well as medium shades on acetate that were unobtainable with the 2G. Light fastness of "Latyl"* Brilliant Blue BG is said to range from 40 to 320 hours depending on the application method employed. Pressure and Thermosol dyeings of the color on "Dacron"* are much superior in light fastness to dyeings made with orthophenylphenol as the carrier. However, dyeings made with orthophenylphenol as the carrier can be greatly improved in light fastness by heat treating, after scouring and drying, for one to four minutes at temperatures of 300° to 380°F. Dyed by customary disperse dye procedures a 2.0% dyeing of the color on acetate withstands 80 hours exposure in the Fade-Ometer and is extremely resistant to atmospheric gas-fume fading. Although the shade of "Latyl"* Brilliant Blue BG is redder than that of "Latyl" Brilliant Blue 2G, its ability to reduce the red shade change of a number of dyes when exposed in artificial light is just as effective. "Latyl" Brilliant Blue BG is suitable for use on "Dynel" where it shows good build-up, good fastness to light and No. 2 washing. It also exhibits good fastness to washing on "Acrilan" but rather poor light fastness.

* Registered Trade-mark

LUMICREASE OLIVE-GREEN FBL (Pat Appl for)
(Sandoz)

This is another addition to the line of direct colors especially recommended for dyeing rayons which require resin treatment. It is reported that the shade of this new product is hardly affected by resin treatments. Its fastness to light, washing, perspiration, decatizing, crocking and hot wet pressing is said to be of very high order. It shows very good reserve of acetate and nylon as well as being dischargeable by the alkaline method. It also shows excellent wet fastness when aftertreated with Cuprofix.

LUMICREASE YELLOW 3LG Pat
(Sandoz)

This new bright yellow is reported to be the fastest-to-light yellow in the Sandoz line and also outstanding in fastness to washing, perspiration and cold water, dyed direct or when aftertreated with urea-formaldehyde or melamine. It also shows excellent wet fastness when aftertreated with Cuprofix. It is also claimed to show a perfect reserve of acetate and nylon. The color is not salt-sensitive and very level dyeing. Solubility is very high which recommends its use in package dyeing.

"LUSANE" BRILLIANT BLUE B**
(Du Pont)

A special vat dye which is an entirely new kind of dye, dierent from any coloring matter previously offered to the textile trade. When applied to cotton or cuprammonium rayon by special dyeing and printing procedures it yields a remarkably brilliant blue with fastness properties said to be comparable to those of vat dyes. "Lusane"** Brilliant Blue B has high stability to resin treatment and is suitable for use on many materials where a brilliant blue that is fast to washing, crocking and light is required. The product can be shaded with vat dyes and dyes from other classes under a variety of conditions. "Lusane"** Brilliant Blue B is unique in its application. Although soluble in numerous organic compounds, special organic solvents available in the trade must be used to achieve color fixation. It is applied by padding in the presence of selected solvents, is thoroughly dried and finally developed by conventional aqueous or steam treatments. The padding liquor must contain 20.0 to 30.0% of the solvent irrespective of the concentration of dye in the pad liquor. The resulting solution is stable for practical periods at temperatures normally encountered under mill conditions. Printing "Lusane"** Brilliant Blue B as a self shade is accomplished by first pasting with triethanolamine and dissolving in peroxide-free "Carbitol" solvent at a temperature no higher than 110°F. This solution is stirred into a starch-tragacanth thickener containing 2.0% sodium sulfite and printed. After printing, the fabric is dried on cans at a temperature of 230° to 250°F for 5 minutes to 1 minute, the higher temperature allowing a shorter drying period.

** Trade-mark

"LUXOL"* FAST BLUE ARN
"LUXOL"* FAST BLUE MBSN
(Du Pont)

These two products are solvent dyes which are especially recommended for use in ball point pen systems because of their solubility, lightfastness and writing properties.

* Registered Trade-mark

MAYVAT* BRILLIANT GREEN BD DOUBLE PASTE ((C I 1101)
(May)

A new cleaner and brighter shade of Mayvat Jade Green.

* Registered Trade-mark

MAYVAT* BROWN BGT PASTE
(May)

A new vat brown similar to *Colour Index* No. 1152 in shade but which does not redden in artificial light. This product has slightly better fastness properties than *Colour Index* No. 1152, and also shows economies in that it builds up more and bleeds less in heavy shades. This color is interesting particularly in the dyeing of work clothing.

* Registered Trade-mark

MAYVAT* BROWN LL PASTE
(May)

A Mayvat specialty dyestuff which is particularly useful in heavy brown shades since it is said to possess excellent build-up properties. It is stated that it is also extremely economical to use and does not bleed at all with peroxide. In combination with Mayvat Slate Blue CR Paste, very economical black-browns can be obtained.

* Registered Trade-mark

MAYVAT* DIRECT BLACK RRBN PASTE
(May)

* Registered Trade-mark

This color is similar in shade to, but not identical with, Prototype 289. It is stated that it is a useful color in that it has excellent fastness properties both as a reddish grey and as a reddish black. Its light and wet fastnes properties are said to be excellent.

MAYVAT* GREY 2G DOUBLE PASTE
(May)

Claimed to be the outstanding grey from the standpoint of light fastness. This product finds application both in yarn and piece goods dyeing. For yarn application, it is recommended that in light shades glue be used to obtain comlete levelness.

* Registered Trade-mark

MAYVAT* KHAKI BGR PASTE
(May)

A new Mayvat specialty dyestuff which is similar to Prototype 122 in shade, but which does not, it is claimed, have the undesirable characteristics of that product particularly with respect to variation of shade with temperature and caustic concentration. This color is recommended for work clothes and also for package and beam dyeing where Prototype 122 is used only with great caution.

* Registered Trade-mark

MAYVAT* MAROON FB PASTE
MAYVAT* MAROON FB DOUBLE POWDER
(May)

An entirely new homogeneous vat dyestuff. Mayvat Maroon FB is said to have outstanding light and wet fastnes, particularly peroxide bleach properties. It is claimed that, in combination with reds such as Red FBB and Red G2B, rose shades can be obtained more economically than with any other dyestuff combination. This product is suitable not only for piece goods, but, with the use of glue, dyes very level on packages and beams. It is furnished in a highly dispersed state, both as Paste and Double Powder.

* Registered Trade-mark

MAYVAT* NAVY BLUE RBP PASTE (C I 1100)
MAYVAT* NAVY BLUE RB POWDER (C I 1100)
(May)

A highly dispersed and level dyeing preparation of the familiar tetrachlorodibenzanthrone. These products are widely used to create navy blue shades. It is stated that, for brightness of shade and economy, these products are highly desirable.

* Registered Trade-mark

MAYVAT* OLIVE GGL PASTE
(May)

A new vat olive which is particularly suitable for military work. It is stated that its outstanding fastness properties both to light, washing and chemic, make it also exceptionaly good for work clothing. The blueness of shade of this color is more than can be achieved by any combination of Mayvat Olive T and Mayvat Olive Green B to which it is chemically related and whose outstanding fastness properties it partakes of.

* Registered Trade-mark

MAYVAT* OLIVE T3R PASTE (Pr 547)
MAYVAT* OLIVE T5R PASTE (Pr 547)
(May)

These products are offered to satisfy the market demand for extremely red shades of Mayvat Olive T Paste. Mayvat Olive T5R Paste is claimed to be the reddest homogeneous Olive T that can be made.

* Registered Trade-mark

MAYVAT* PRINTING BLACK M DOUBLE PASTE
(May)

A new anthraquinone printing black which is claimed to be desirable for use where outstanding fastness and resistance to crocking is called for. It is stated that an outstanding feature of this color is that there is no bleed-off with solvents which sometimes is the case with printing blacks.

* Registered Trade-mark

MAYVAT* PRINTING GREY B PASTE
(May)

This color is said to show excellent levelness and speck-free prints which are extremely light and wash fast. This color is recommended for drapery work.

* Registered Trade-mark

MAYVAT* RED G2B PASTE (Pr 124)
(May)

A bluish red dyestuff of high tinctorial properties. This product is said to have excellent all around fastness properties.

* Registered Trade-mark

MAYVAT* SLATE BLUE CR PASTE
MAYVAT* SLATE BLUE CR POWDER
(May)

A specialty dull blue shade. These new products are said to offer the package and beam dyer, as well as the piece goods dyer, a very versatile level dyeing color which applies equally well in light grey as in midnight blue shades. It is stated that these products have excellent light and wet fastness properties although they redden slightly in the No. 4 chlorine test.

* Registered Trade-mark

METOMEGA CHROME ORANGE PML
(Sandoz)

The manufacturer reports this to be similar in shade and dyeing properties to their well-known Metomega Chrome Orange ML, but the new type is claimed to be superior and outstanding in its fastness to cross dyeing and potting. It is also reported to be slightly faster to fulling. Light fastness is of the highest order and rated (6-7) in medium depths.

NAPHTOL AS-BC SUPRA
(General Dyestuff)

A new nonsubstantive naphthol developed and especially recommended for the continuous production of low-cost blacks on cottons or rayons in padding where the dried naphthol is coupled with Fast Blue Salt BN. The resultant black is said to have fastness properties that are much better than those obtainable with developed direct or sulfur dyestuffs, namely, very good fastness to light (6) and very good fastness to washing (4); the fastnes to 0.3% chlorine, however, is rather poor. A good black is obtainable on cotton by padding with 4 oz of Naphtol AS-BC Supra, drying, and coupling with 12 oz of Fast Red Salt BN per gallon. Like other Supra-type naphthols, this one also is dissolved merely by dispersing in plain water and adding the dispersed naphtol to a bath primed with caustic alkali.

NAPHTOL AS-BI (Patented)
(Progressive)

Produces with Fast Bordeaux Salt OL full bordeaux shades fast to peroxide.

NAPHTOL AS-IRG (Patented) AND AS-AG (Patented)
(Progressive)

Produce for the first time with Fast Scarlet Salt AFA, Fast Black Salt K, Fast Bordeaux Salt OL and others a range of shades from lemon yellow to orange, scarlet, red and bordeaux.

NAPHTOL AS-S (Patented) AND AS-LR (Patented)
(Progressive)

Naphthols of high substantivity, Naphtol AS-S is claimed to be the only naphthol that exhausts practically completely from a long liquor ratio.

NATIONAL ALIZAROL BROWN DKL
(National)

A chrome dye of excelent solubility applicable to wool by the top, meta and bottom chrome methods of dyeing. Applied to wool by the top-chrome process, it produces medium shades of brown, by the meta-chrome process, the shade is slightly redder, but when dyed bottom-chrome the shade is considerably yellower and duller. The manufacturer reports that it exhibits good fastness to light and very good to excellent fastness to washing, perspiration, cold and sea water bleeding, carbonizing and dry cleaning. This product's outstanding characteristic is its very good fastness to cross dyeing. The results of laboratory and mill trials indicate that it is a very superior product in this respect.

NATIONAL BLUE 3BVS SALT
(National)

A stabilized diazonium salt used to produce, on cotton or viscose rayon, a range of pleasing shades varying from greenish to reddish blue with the various National Naphthols. The manufacturer reports most of these colors exhibit very good to excellent fastness to light, washing, soda boil and other wet processing. This very versatile product may be applied on the continuous padding range, in pressure package dyeing machines, and in open tubs. It is suitable for application by the various printing processes and many of the combinations can be discharged to excellent white with hydrosulfite discharge pastes. This product is highly recommended for coloring materials for sport and work clothes, children's play clothes and materials that are to be resin-finished. It should also be noted that couplings with selected National Naphthols produce blue shades of excellent fastness.

NATIONAL CARBANTHRENE BRILLIANT VIOLET RK DOUBLE PASTE
(National)

An anthraquinone vat dye, producing on cotton and rayon, bright bluish-violet shades of exceptionally good all-round fastness. The leuco form of this dye possesses very good solubility, is excellently suited for application in all types

of machines, and can be applied by the various pigment impregnation methods as well as by the reduced dyeing method. The manufacturer reports that, in full and medium shades, this dyestuff is rated as having maximum fastness to light, while in light shades it is rated excellent. In addition, it possesses very good to excellent fastness to commercial laundering, boiling soap and soda, chlorine, stoving, cross dyeing, perspiration and sea water, it is suitable for materials that are to be rubberized and is practically unaffected by resin finishing for crease resistance.

NATIONAL CARBANTHRENE BROWN ARN DOUBLE PASTE
(National)

An anthraquinone vat dye producing, on cotton and rayon, bright brown shades which the manufacturer reports as of maximum fastness to light and excellent fastness to most wet processing including boiling soap, chlorine bleaching and stoving. It reduces readily at 140°F in a moderately alkaline bath to a red-brown leuco and is usually dyed at 120°F. It may also be applied by the various impregnation methods and is suitable for use in various types of pressure dyeing equipment. The manufacturers state that this product is one of the fastest dyestuffs available and is highly recommended by them for the production of materials that must possess exceptional resistance to light and commercial laundering.

NATIONAL CARBANTHRENE OLIVE G PASTE
(National)

This anthraquinone vat dye, produces, on cotton and rayon, true yellowish-olive shades. It reduces readily at 140°F to a dull green leuco, is usually dyed at 120°F, and because of its excellent affinity, requires the addition of salt only in heavy shades. It may also be applied by the various pigment impregnation methods, is unaffected by the presence of metals in the dyebath and is suitable for use in all types of dyeing equipment. The manufacturers report that this dyestuff has excellent fastness to light, commercial laundering, boiling soap, and practically all wet processing and is highly recommended by them for the production of materials that are to be subjected to excessively hard usage such as sport and work clothes, uniforms, draperies and weatherable upholstery materials. Materials dyed with this product are suitable for rubberizing and are practically unaffected by resin finishing.

NATIONAL CARBANTHRENE OLIVE TR PASTE
(National)

An anthraquinone vat dye which produces when applied on cotton and rayon, olive-gray shades of a reddish cast. It is applicable by all the usual methods of dyeing either in a reduced bath or the various pigment impregnation methods. The manufacturers report that materials colored with this product are characterized by excellent fastness to light, washing, perspiration, water, stoving, cross dyeing and mercerizing and very good fastness to alkalis, acids, boiling soap, chlorine, rubbing and hot pressing. These superior fastness properties render Carbanthrene Olive TR Paste of great importance in the production of the various government shades. It is obvious, according to the manufacturers, that this dyestuff is a valuable component in the production of various shades of grey, tan, khaki, olive and green tones wherever superior fastness properties are demanded.

NATIONAL CARBANTHRENE YELLOW PG DOUBLE PASTE
(National)

An anthraquinone vat dye which produces, when dyed on cotton or rayon, moderately bright reddish shades of yellow. This dyestuff is applicable by all the methods of dyeing in open tubs, on the continuous range, in package machines and, as it is unaffected by the presence of metals in the dyebath, it can be dyed in iron machines with practically no dulling. The manufacturers report that National Carbanthrene Yellow PG Double Paste exhibits excellent fastness to all wet processing including bleaching, cross-dyeing and perspiration. It is especially recommended for coloring materials that are to be resin finished for crease resistance, as its very good fastness to light is definitely increased by such treatment.

NATIONAL CARBANTHRENE YELLOW 3R PASTE
(National)

An IW group, anthraquinone vat dye, producing, on cotton and rayon, very reddish shades of yellow. When applied from a reduced bath it reduces readily at 140°F in a moderately alkaline bath to a dull red leuco. It is usually dyed at 120°F with the addition of common salt to the dyebath. It may also be applied by the various pigment impregnation methods. According to the manufacturer, this product has excellent fastness to light, washing, boiling soap, chlorine and peroxide bleaching, stoving, mercerizing and perspiration. It is practically unaffected by resin finishing for crease resistance and may be used to color materials that are to be rubberized.

NATIONAL CHROMOLAN RED GRE
(National)

A nondusting, premetallized acid dye, producing, when applied to wool, moderately bright shades of yellowish red. The manufacturer reports that this very soluble product exhibits very good to excellent fastness to light, washing, perspiration, carbonizing and cold water bleeding. This deyestuff is especially recommended for dyeing un-neutralized carbonized pieces and other woolen materials in a highly acidic condition, including materials that have been acid chlorinated. It is also suitable for the dyeing of nylon from an acid bath. It is recommended for coloring carpet yarns, knitting yarns for hosiery, sweaters and bathing suits as well as for high grade ladies dress goods.

NATIONAL ERIEFORM YELLOW GR
(National)

A nondusting direct dye, producing, on cotton and rayon, moderately bright shades of medium yellow. Aftertreatment with formaldehyde and acetic acid improves the wet fastness, does not affect the light fastness, nor its excellent dischargeability with either alkaline or neutral pastes. It reserves acetate rayon and is suitable for coloring materials that are to be rubberized. Aftertreatment with urea-formaldehyde resin for crease resistance, changes the shade but slightly, increases the fastness to wet procesing and has a distinctly beneficial effect upon the light fastness. This is one of the few direct dyes that shows a very definite increase in light fastness when resin finished.

NATIONAL FAST LIGHT YELLOW 2GML
(National)

An acid dye which, when applied to wool from a bath acidulated with sulfuric acid, produces moderately bright shades of clear yellow. It may also be dyed from a weak acetic acid dyebath and possesses fair affinity for wool in a neutral bath. The manufacturer reports that this product has excellent fastness to light and very good fastness to water, sea water and perspiration and is especially recommended for the coloring of carpet, bathing suit and sweater yarns.

NATIONAL GARNET GBC SALT
(National)

A stable diozonium salt used to develop the various National Naphthols to varying shades of bordeaux, garnet and reddish brown. Most of the colors produced with this product exhibit very good fastness to light, washing and boiling soda. It can be applied to cotton and rayon in the form of raw stock, yarn or piece goods, in open tubs, pressure dyeing machinery, on the jig or reel, or by the continuous padding method. Materials colored with National Garnet GBC Salt can be resin finished for crease resistance with practically no change in shade or light fastness. It is highly recommended for the production of deep red shades on materials intended for sport, play or work clothes that must withstand vigorous laundering.

NATIONAL NACCOGENE BLUE DGN POWDER
(National)

A stabilized azoic dye producing, when printed on cotton and rayon, subdued shades of blue in low concentrations and full bloomy navies in high concentrations. This product has very good printing paste stability and, like all the Naccogenes, can be printed along with leuco vat ester dyes such as the National Solvats. The manufacturer reports that it possesses excellent fastness to washing, perspiration and sea water; very good fastness to boiling soap and boiling soda; and good to fair fastness to hot pressing, rubbing and light.

NATIONAL NACELAN PINK 3B
(National)

An anthraquinone disperse dye which produces, when dyed or printed on acetate rayon, bright shades of pink and bluish red. Applied to nylon, the colors obtained are much bluer than those produced on acetate, with somewhat superior fastness properties. It may also be used to color Dacron either at high temperatures or at the boil with a suitable carrier. The manufacturer reports that this very useful dyesturr possesses very good to excellent fastness to perspiration, acid, alkali, water, sea water and hot pressing, and good fastness to light.

NATIONAL NIAGARA BLUE BVW
(National)

A very soluble, nondusting direct dye, producing, on cotton and rayon, moderately bright medium shades of blue. The manufacturer reports that it possesses very good fastness to washing and excellent fastness to perspiration, cold and sea water bleeding and spotting as well as mercerizing. Aftertreatment with formaldehyde and acetic acid improves the washing fastness and does not impair its fairly good light fastness, nor its excellent dischargeability with either alkaline or neutral pastes. Aftertreatment with National Naccufix in conjunction with urea-formaldehyde resins for crease resistance, improves the fastness to light considerably and the fastnes to washing to the extent that it becomes comparable to some of the vat dyes. It should be noted that this is one of the fastest to washing direct dyes.

NATIONAL NIAGARA FAST COPPER BLUE R
(National)

A very soluble, nondusting direct dye, producing, on cotton and rayon, reddish shades of moderately bright blue. However, it is seldom employed as a simple direct dye, but is usually aftertreated with either copper sulfate or National Naccufix. Copper aftertreatments result in greener shades of blue possessing very good light fastness. When aftertreated with National Naccufix, either alone or in conjunction with urea-formaldelhyde resin finishes for crease resistance, it exhibits very good to excellent light fastness and washing fastness equal to that usually associated with developed dyes.

NATIONAL SOLANTINE BLUE BLL
(National)

A light-fast, nondusting direct dye, which produces on cotton and rayon, reddish shades of moderately bright blue. The manufacturer reports that this dye possesses outstanding fastness to light, rayon dyeings of medium depth being rated 8, the maximum A.A.T.C.C. rating. Aftertreatment with urea-formaldehyde or melamine resins alters the shades slightly greener and brighter, with but little loss in light fastness. This slight loss in light fastness can be completely eliminated by the addition of National Naccufix to the urea-formaldehyde resin. A simple aftertreatment with Naccufix increases the wet fastness properties of this dye equal to the results obtained with developed dyes, plus the retention of maximum light fastness.

NATIONAL SOLANTINE BLUE GLFV
(National)

An exceptionally fast-to-light, nondusting direct dye producing, when dyed on cotton or rayon, moderately bright shades of blue. Medium depth dyeings on rayon are rated 8 for light fastnes, the maximum A.A.T.C.C. rating, and although resin finishing for crease resistance alters the shade slightly greener and brighter, the light fastness suffers little impairment. The addition of National Naccufix to urea-formaldehyde resin finishes results in a very marked increase in washing fastness and no loss in light fastness. This product is recommended for the production of ladies' dress goods and suitings, as well as all types of sport and play clothes, especially those materials that are to be resin finished and subsequently subjected to prolonged exposure to sunlight.

NATIONAL SOLANTINE BLUE SFRL
(National)

A light-fast, nondusting direct dye, producing, on cotton and rayon rather bright shades of reddish blue. It is practically unaffected by the presence of Monel metal or copper in the dyebath and leaves nylon and acetate rayon unstained. The manufacturer reports that this product possesses very good fastness to light, alkalies and cold and sea water spotting. Aftertreatment with National Naccufix or with a combination of Naccufix and urea-for-maldehyde resin for crease resistance, has practically no effect upon shade or light fastness, but improves the resistance to wet processing.

NATIONAL SOLANTINE VIOLET BL
(National)

A nondusting, fast-to-light, direct dye, producing moderately bright shades of bluish-violet when dyed on cotton and rayon. It is only slightly affected by the presence of metals in the dyebath, reserves acetate and can be applied at low temperatures. This dye is recommended for coloring mixtures of cotton and wool and also viscose and wool, since the wool is tinted fairly close in character of shade, though lighter than cotton and viscose.

NATIONAL SULFUR BROWN CGCF
(National)

A nondusting sulfur dye which produces, on cotton and rayon, moderately bright shades of reddish tan. It dissolves readily with an equal amount of sodium sulfide, can be dyed in the various types of pressure machines and is practically unaffected by the presence of metals in the dyebath. The manufacturer reports that medium depth dyeings on cotton exhibit very good fastness to light, washing with soap and soda at 160°F, perspiration and mercerizing, and excellent fastness to cross dyeing, dry cleaning and hot pressing. This dye is suitable for coloring materials that are to be rubberized. Urea-formaldehyde resin finishing for crease resistance, alters the shade but slightly but does not affect the very good fastness to light.

NATIONAL SULFUR DIRECT BLUE N
(National)

A nondusting sulfur dye which, when applied to cotton or rayon, produces moderately bright blue and navy shades. Because it is practically

unaffected by the presence of metals in the dyebath, this product may be used in iron machines with no dulling. It is suitable for coloring materials that are to be ruberized or resin finished for crease resistance. The manufacturer reports that medium strength dyeings on cotton exhibit good to very good fastness to light, organic acid, mercerizing and cross dyeing and excellent fastness to alkalis, stoving, perspiration, water, sea water, hot pressing and dry cleaning. This product is at present finding extensive use in the production of economical navy shades on cotton materials, especially corduroy.

NEOLAN® YELLOW RE
(Ciba)
Outstanding because of its uniform exhaust rate. Neolan Yellow RE is said to possess, in addition, very good fastness to light and washing and good all-round fastness properties on wool at all stages of manufacture. This product can be applied to unweighted and weighted silk and to nylon, yielding dyeings which are dischargeable to white.

® Registered Trade-mark

NEOPILATE DYESTUFFS
(Nova)
This represents a new range of wool dyestuffs of the metal complex series. This group is said to exhibit very high fastness properties, particularly to light and rubbing, and to have good solubility and excellent leveling properties. The group comprises nine types representing one yellow, one orange, one red, several violets and blues and one brown.

NEUTRALAN BROWN R
NEUTRALAN ORANGE R
NEUTRALAN RED B, 3B
NEUTRALAN YELLOW G
(Pharma)
Members of a new series of metallized dyestuffs developed for application on wool, nylon and silk. They are said to be characterized by their unusual levelness in very light shades on wool and for their very high light fastness on wool, nylon and silk. They are simply applied from slightly acid baths. It is stated that the fastness to light, washing, fulling, perspiration and so forth are very good to excellent. The fastness properties on nylon are, in general, equal or better than the fastness on wool.

OFNA-CET COLORS
(Progressive)
Produce shades said to be fast to perspiration, washing, light and crossdyeing on acetate. They can also be used for nylon.

OFNA-LAN COLORS
(Progressive)
Special naphthols that can be dyed on mixtures of wool and rayon to produce solid shades said to be of excellent fastness properties. The range of shades is practically complete.

OFNA-PERL SALT RRA (Patented)
AND OFNA-PERL SALT BBA (Patented)
(Progressive)
Fine dispersions of stabilized diazo compounds which are applied from the same bath with naphthols to exhaust on nylon at 160°F. By a simple aftertreatment with diluted mineral acids, shades are developed on the fiber which are said to possess excellent fastness properties without a barré effect. They have also affinity to acetate. They dye mixtures of nylon acetate and cellulosic fibers and also mixtures of nylon and wool when used in combination with Ofnalan colors.

ORCOCHROME BLACK P NEW
(Organic)
A new chrome dyestuff for wool yarn, stock or piece goods. It is stated that Orcochrome Black P New can be used with confidence where a rating of 4 to 5 is required in fastness to cross dyeing, fulling, potting, washing, and crocking. The color is said to possess a light fastness rating of 7 and, due to its exceptional solubility, to have very good leveling properties.

ORCOMINE BLACK RBM CONC
(Organic)
A recent addition to Organic's line of direct blacks. This particular dyestuff produces a deep full black on cotton and rayon and, since it is said to reserve Celanese so well, is highly recommended by the manufacturers for use where an acetate rayon decoration is to remain white. The fastness properties of Orcomine Black RBM Conc are comparable to others in its class.

ORTOLAN DYESTUFFS
(Nova)
This new group of colors which is represented by Ortolan Yellow G, Orange R, Red G, Violet B, Blue G and Brown 3R represents neutral dyeing metal complex dyestuffs suitable for wool as well as in union shades with nylon. The Ortolan dyestuffs are claimed to be extremely fast to light, have excellent levelling properties and a much shorter dye cycle than usual in wool dyeing.

PAPER FAST YELLOW 2GP
(Ciba)
A greenish yellow said to possess superior fastness to alkali. In addition, its fastness to chlorine is said to be excellent. It is stated that it is very suitable for beater dyeing, has excellent affinity for bleached and unbleached stocks, and has good fastness to acid and sodium silicate. In bond papers it shows minimum two-sidedness; has, in addition, good affinity for fillers such as clay and titanium dioxide, and is fast to ink eradicators.

PAPER ORANGE RP CONC
(Ciba)
Is an economical product with good build up for the paper trade and very good cold water solubility.

PATENT BROWN GR (Patented)
(Progressive)
A straight acid brown claimed to have unsurpassable level dyeing properties.

PERMANENT VIOLET RL (Patented)
(Progressive)
A very bright pigment violet said to be of outstanding fastness to light. It is claimed to be a perfect violet suited for shading phthalocyanine blues to royal or ultramarine blue shades. It is insoluble in most solvents and plasticizers, it does not migrate in rubber and does not break in vinyl blends after 200 hours exposure in the Fade-Ometer.

PERMANENT VIOLET RL EXTRA POWDER
(General Dyestuff)
A vat dyestuff especialy prepared for use as a pigment toner, which is claimed to display properties characteristic of superior pigment toners like the Heliogen Blues: namely, excellent fastness to light, excellent fastness to bleeding in water and most organic solvents, excelent fastness to acid and alkali, and high tinctorial value. As a volet this new pigment toner is very much redder than the Heliogen (phthalocyanine) Blues and much bluer than other vat-dye-pigment violets like the Anthragen Red Violet R and 4R types. Permanent Violet RL Extra Powder is recommended for use as a pigment toner either alone or as a reddening agent for the Heliogen Blues where the best fastness and brightness are required, such as for printing inks, paints, lacquers, enamels, plastics and rubber. It is also recommended for use as a pigment for printing and coloring textiles, including glass fabrics, in resin formulations.

PERMANENT VIOLET RL EXTRA PRESSCAKE
(General Dyestuff)
A presscake form of the pigment toner contained in Permanent Violet RL Extra Powder (qv) prepared for those who wish to use it for flushing or other purposes where a presscake is desired. It contains 23 to 24% of solids.

PHARMALAN RED RN
(Pharma)
A new addition to the Pharmalan line of chromiferous colors for wool. It is said to have all the excellent properties and simplicity of application of this group of colors. The product dyes wool, silk and nylon leaving acetate, cotton and viscose rayon white.

PHARMANTHRENE YELLOW GC PASTE
(Pharma)
A bright, clear, greenish-yellow vat dye of the anthraquinone group. The product is suitably prepared for dyeing, pad dyeing and printing on both cotton and viscose.

PHARMASOL BLACK AB
PHARMOL BLACK AB
(Pharma)
A stabilized azoic. It is a deep economical black said to possess excellent fastness properties. The product is available as a Pharmasol, with the simplicity and ease of application characteristic of these preparations, and also as a Pharmol or powder type.

PHARMASOL BLACK J
PHARMOL BLACK J
(Pharma)
A stabilized azoic. It is a deep economical black said to possess excellent fastness properties. It has a somewhat bluer shade than the AB type. The product is available as a Pharmasol, with the simplicity and ease of application characteristic of these preparations, and also as a Pharmol or powder type.

"PONSOL"* SCARLET GL PASTE
(Du Pont)
An anthraquinone vat scarlet said to possess very good light and wet fastnes properties and much brighter in shade than obtainable with mixtures of existing anthraquinone types. "Ponsol"* Scarlet GL Paste is recommended for use in the awning trade, for draperies, upholstery fabrics and dress goods and for the production of pink, peach, salmon and scarlet shades. When exposed in artificial light the shade becomes yellower and brighter. It dyes satisfactorily over a broad range of temperature and caustic conditions, and has good build-up properties. It has good stability in the reduced form for 1½ hours at both 120° and 140°F and becomes noticeably weaker after standing for two hours. The product reduces completely in 3 minutes at 120°F, and requires 20 minutes for reduction at 80°F. "Ponsol"* Scarlet GL Paste exhausts completely and can be applied by any available method of including package dyeing.

* Registered Trade-mark

RAPIDOGEN* BLACK II
(General Dyestuff)
An azoic printing black for development in acid aging, which is characterized by jetness and richness of shade without tendency of bronzing and by low cost. It is said to display good wet fastness (washing, 3-4 and chlorine, (2) and fairly good (4) light fastness in full shades. A desirable feature is good (3) fastness to overprinting with caustic soda for plissé effects. Prints may also be developed satisfactorily by the RNA method in neutral steam without too much loss in apparent strength.

* Registered Trade-mark

RAPIDOGEN* BLACK A NEW
(General Dyestuff)
A new azoic printing black for printing deep rich blacks free from bronziness on cellulosic fabrics with development in acid aging when economy and very-good-to-excellent (4-5 for AATCC Wash Test No. 4) fastness to washing are of primary concern. The fastness to light of such prints is said to be fairly good (4), or adequate for such end uses as table linen, cotton and rayon dress goods that receive a resin finish, pajama materials and other fabrics for which commercial light fastness suffices. Good (3) fastness to hot pressing and good (3) fastness to overprinting with caustic soda for plissé effects are additional desirable features. The fastness to formaldehyde has been found satisfactory in mill production for use alongside pigment prints.

* Registered Trade-mark

RAPIDOGEN* NAVY BLUE GA SOLUTION
(General Dyestuff)
A new, straight, stabilized azoic composition in ready-to-use solution form recommended for the screen and roller printing of fast navy shades on cotton and rayon with development in acid aging. It is claimed for this product that its excellent wet fastness and fairly good (4) light fastness are noteworthy for a dyestuff that is so economical for heavy shades. Prints display excellent (5) fastness to AATCC Wash Test No. 4 and good-to-very-good (3-4) resistance to chlorine. It is therefore especially recommended for printing table linen, washable dresses, pajamas, and play clothes. Good (3) resistance to overprinting with caustic soda permits use of this navy for cottons that are to be given a plissé finish. A further feature, which is said to give this azoic product an advantage over some vat navies, is excellent (5) resistance to hot pressing.

* Registered Trade-mark

REMALAN BRILLIANT BLUE B (Patented)
(Progressive)
A representative of a new class of acid dyes (not metallized) producing brilliant blue shades on wool and nylon which are claimed to have unsurpassed wet fastness properties and very good fastness to light.

REMALAN YELLOW GG (Patented)
(Progressive)
Belongs in the same class as Remalan Brilliant Blue B and produces similar fastness properties on wool and nylon.

REMASTRAL BLUE FFRL, F3GL, FF2GL
(Progressive)
As bright, direct blue dyes said to be of exceptional fastness to light they are of special importance for upholstery fabrics.

SANDOTHRENE BLACK N2B DOUBLE PASTE
(Sandoz)
A full black of green tone which is developed from a green to a black shade with either nitrous acid or sodium hypochlorite. This paste is highly dispersed and builds well. It reduces easily to a highly soluble level dyeing leuco. As a black shade it is said to possess very good all-around fastness and is recommended for use on all the conventional type dyeing machines for producing blacks and as a shading element for dark navies.

SANDOTHRENE BROWN NBG PASTE
(Sandoz)
This anthraquinone vat color, recently announced by Sandoz, is reported to have excellent dispersibility and therefore finds much use in package and skein dyeing. It is stated that it is very level dyeing and has excellent fastness except to heat and moisture. It is a principal component of army khaki shades.

SANDOTHRENE BROWN NBR PASTE
(Sandoz)
This highly dispersed anthraquinone vat color is used in the production of dark browns where maximum fastness is required. It is level dyeing in nature and stands high temperatures very well. The dyeings on viscose are somewhat duller and yellower than those on cotton.

SANDOTHRENE BROWN NR DOUBLE PASTE
(Sandoz)
One of the most useful of the anthraquinone vat browns for dyeing tan shades, due to its high dispersibility, all-around fastness and level dyeing properties. The manufacturer reports that it stands high temperatures somewhat better than Sandothrene Brown NBR and is recommended for the production of dark shades on awning materials.

SANDOTHRENE DARK BLUE NBO PASTE
(Sandoz)
A very strong tinctorial vat paste of the anthraquinone series. For navy shades on cotton, rayon or silk where it is said to exhibit excellent fastness to severe laundering, perspiration, peroxide bleach and light. It is well suited for application by the pigment pad-jig, continuous machine, reduced bath method and for printing.

SANDOTHRENE DARK BLUE NR DOUBLE PASTE
(Sandoz)
A vat of anthraquinone derivation, said to possess excellent tinctorial value and superior fastness to severe laundering and bleaching. It is stated that its high dispersion and outstanding level dyeing characteristics renders it a valuable component in producing greener types of navy shades on stock, skeins, packages, beam and piece goods dyeing machines.

SANDOTHRENE GOLDEN ORANGE NG PASTE
(Sandoz)
This highly dispersed anthraquinone vat dye is recommended by the manufacturer for package and skein dyeing, especially in full shades. It is used for dyeing cotton-viscose unions. It is said to possess good light fastnes in full shades and to withstand high temperatures well.

SANDOTHRENE GOLDEN ORANGE N3G PASTE
(Sandoz)
An anthraquinone vat color producing pleasing bright orange shades on both rayon and cotton and said to possess excellent all-around fastness. The change of shade and strength which is brought about by soaping the material after dyeing is negligible. Since it does not tender the fiber when the fabric is subjected to prolonged sun exposure, this dye may be used for curtains, draperies and awnings.

SANDOTHRENE OLIVE N2B DOUBLE PASTE
(Sandoz)
An anthraquinone vat dye, highly dispersed and said to possess excellent all-around fastness. Its ability to stand high temperatures and build well renders it to be especially well suited for high speed continuous methods.

SANDOTHRENE OLIVE N2R DOUBLE PASTE
(Sandoz)
A highly dispersed vat color of anthraquinone derivation. It is said to be characterized by its very level dyeing and fastness to bleaching, washing and light. Its ability to maintain its vat and to exhaust well renders it suitable for dyeing cotton in all stages of manufacture in all types of machines.

SANDOTHRENE OLIVE NT PASTE
(Sandoz)
An antraquinone-type dyestuff manufactured as a highly dispersed pigment in free flowing paste form, and said to exhibit outstanding fastness to light, weather, laundering and bleaching.

SANDOTHRENE OLIVE NTR PASTE
(Sandoz)
This anthraquinone product is reported to be slightly redder in tone than its companion color, Sandothrene Olive NT Paste; otherwise, it exhibits identical high degrees of dispersion and excellent fastness properties. Characterized by its rapid rate of exhaust and ability to build well, it is especially well suited as a component for dyeing work clothing and olive drab shades by high speed continuous methods.

SANDOTHRENE OLIVE NTRR PASTE
(Sandoz)
Produces a slightly redder tone than its companion color, Sandothrene Olive NTR Paste, otherwise it is identical as to its high degree of dispersion and excellent fastness ratings. It is claimed that its extraordinary fastness to light and excellent fastness to washing, chlorine and peroxide, renders it especially favorable for awnings, curtains and colored effects in textiles which are bleached after weaving.

SANDOTHRENE RED ORANGE NG PASTE
(Sandoz)
This anthraquinone vat color is extensively used in dyeing and printing. It is said to possess good fastness in heavy to medium shades and to possess the best money value of the golden orange types. It is used in skein and package dyeing, also for the production of medium and full shades on cotton-viscose union fabrics.

SANDOTHRENE VIOLET N3B PASTE
(Sandoz)
This is another addition to the Sandoz line of vat colors of the anthraquinone group. It is recommended as a reddening agent for bright reddish-blues and lighter shades of lavender and grey. Reddens with chlorine and is used with blues which turn greenish when treated with chlorine. It is reported to be fairly good for covering dead cotton and to have very good all-around fastness except to water spotting and hot pressing.

SANDOTHRENE YELLOW NPGA DOUBLE PASTE
(Sandoz)
This highly dispersed anthraquinone vat color is recommended by the manufacturer for application by the pigment, reduced or continuous methods. It exhibits very little sensitivity to changes in temperature or concentrations of caustic soda. Metals have a negligible effect on the shade. They also state it is suitable for application to both cotton and rayon in the form of yarn and piece goods, and because of its particularly good fastness to washing, is recommended for materials intended for work clothing, towelings and similar items.

SANDOTHRENE YELLOW NGC PASTE
(Sandoz)
This anthraquinone vat color is widely used in printing and dyeing as a self shade and in combination with greens and bright blues for the production of Kelly greens. It is highly dispersed. It is said to possess excellent fastness properties to destructive forces with the exception of light. It withstands high temperatures and has good money value.

SETACYL* BROWN 2GR SUPRA
(Geigy)
It has long been the practice of dyers using dispersed colors on acetate and nylon to make their browns using combinations of blue, red and yellow for there were very few homogeneous types on the market. In this new color Geigy offers a homogeneous dyestuff which is said to produce a rich red shade of brown that can well serve as a base color for delustered acetate and spun and delustered nylon fabrics. It is a slow drawing dyestuff requiring temperatures just below the boil to obtain good exhaustion and produces extremely level shades.

* Registered Trade-mark

"SEVRON" BLUE 2G**
(Du Pont)
The greenest blue in the new range of cationic dyes for "Orlon"* type 42 acrylic fiber. It is suitable for reducing the red shade change exhibited by a number of dyes when exposed in artificial light. "Sevron"** Blue 2G is a bright, lightfast, pure blue recommended for use in producing fast-to-light shades of blue, aqua, ice blue and turquoise. Combinations of "Sevron"** Blue 2G, "Sevron"** Green B and "Sevron"** Blue B will enable the production of a range of bright shades from green to reddish-blue in pastel to medium strengths said to possess outstanding fastness. "Sevron"** Blue 2G has good solubility in either hot or cold water and is stable in acidic and neutral dyebaths when applied by the recommended dyeing method. It has a slower dyeing rate than a number of the other cationic dyes which is an advantage in producing light shades with dyes having similar rates. It is suitable for dyeing unions or blends of "Orlon" type 42 and wool or rayon since it does not stain the latter fibers. It has affinity for acetate, nylon and silk but is inferior in fastness properties to dyes prepared especially for these fibers. However, bright shades can be dyed or printed on both acetate and silk provided the end use fastness requirements are not too severe.

* Registered Trade-mark
** Trade-mark

"SEVRON" GREEN B**
(Du Pont)
"Sevron"** Green B produces bright green shades on "Orlon"* type 42 acrylic fiber and is said to have very good wet fastness properties. It has better light fastness than older cationic dyes and will be particularly useful in making fast-to-light shades of green, aqua and green-blue, and in some instances, grays and tans, in combination with either "Sevron"** Yellow L, "Sevron"** Blue B, or both. The product is also of interest for dyeing "Orlon" in blends with wool or rayon since it shows little staining of either fiber. "Sevron"** Green B builds up efficiency at concentrations of 3.5 to 4.0% but is not recommended for deep shades of navy or hunter green. It should be dissolved in acidified water before adding to the bath. Du Pont Retarder LAN textile processing agent is recommended for use in obtaining level dyeings with the color, especially in the lighter shades. A retarding agent is not necessary for shades containing more than 2.0% of dye. "Sevron"** Green B shows a blue-green shade change when exposed in artificial light, although the change is not so bright as that exhibited by Du Pont Brilliant Green Crystals. Like other "Sevron"** dyes, "Sevron"** Green B can be applied to acetate and silk by selected dyeing procedures but possesses no outstanding properties that cannot be obtained with dyes specifically designed for the fibers mentioned.

* Registered Trade-mark
** Trade-mark

"SEVRON" YELLOW R**
(Du Pont)
"Sevron"** Yellow R produces clear, bright yellows on "Orlon"* type 42 acrylic fiber, has good build-up properties and is recommended for use in combination shades such as charcoal, brown and black. The product is redder in shade than "Sevron"** Yellow L and has equal light and wet fastness properties. It is not stable in the dyebath when applied under neutral or alkaline conditions. Acetic acid must be present to produce optimum color value. "Sevron"** Yellow R shows very little staining of either wool or rayon when dyeing the component of "Orlon"* in blends containing either of the other two fibers. It also has affinity for acetate, nylon and silk but is inferior in fastness properties to dyes designed for these fibers.

* Registered Trade-mark
** Trade-mark

SOLOPHENYL* BLUE 7GL
(Geigy)
A color which should appeal to those mills coloring spun rayon fabrics which are subsequently subjected to urea formaldehyde wrinkle crease finishing. It is stated that this fairly bright greenish blue is only slightly altered in shade and its very good light fastness but slightly affected by the TBL treatment. The wet finishing properties, which are said to be better than average when used as a simple direct color, can be considerably enhanced by an aftertreatment of Gycofix 67 or the use of the Gycofix in combination with TBL. Although there are many direct blues now on the market with very good light fastness it is stated that very few are as green and bright as Solophenyl Blue 7GL. Another advantage of the new color is said to be that it fades on cast and does not go to the red, dull side as do many of the older light fast blues.

* Registered Trade-mark

SPECTROSOL* DOUBLE SOLUTIONS
(Hilton-Davis)
Spectrosol Yellow GN Double Solution
Spectrosol Yellow GS Double Solution
Spectrosol Scarlet R Double Solution
Spectrosol Red G Double Solution
Spectrosol Blue PD Double Solution
In addition to the regular line of Spectrosol Single Solutions and Spectrosol Concentrated Solutions, the above Double Strength Solutions of Spectrosols are available. Spectrosols are stabilized azoic compounds prepared especially for the printing of cotton and rayon fabrics.

* Registered Trade-mark

SPECTROSOL* VIOLET B SOLUTION
(Hilton-Davis)
A stabilized azoic composition in solution form recommended for the printing of cotton and rayon. Produces bright shades in the blue violet range. Prints are developed in acid aging. Fastness properties are said to include good fastness to washing and chlorine, hot pressing, and caustic over printing.

"V" PASTES
(Arnold, Hoffman)
A comprehensive range of pigment pastes especially adapted for the mass coloration of viscose rayon. These pigments have extremely fine particle size, a prime requisite of dope dyers. The "V" Pastes are said to possess fastness properties comparable with, and in many cases, superior to the fastest vat dyestuffs. Their application is not confined to dope dyeing: they are used in the coloring of inks, paper-coating finishes, emulsion paints, soaps, and in other instances where pigments with high tinctorial value and fine particle size are desirable. The "V" Paste range includes:
Monolite Fast Yellow GNVS Paste
Monolite Fast Yellow 10GVS Paste
Monolite Fast Red 2RVS Paste
Monolite Fast Red 4RHVS Paste
Monolite Fast Rubine FBHVS Paste
Monolite Fast Brown 3GVS Paste
Monolite Fast Blue BVS uPste
Carbon Black VS Paste
Indigo VS Paste

VAT BLUE HCGK AND HCRK (Patented)
Powder fine for Dyeing
(Progressive)
Very bright vat blue on cotton and rayon, said to be completely fast to chlorine. Very level dyeing on rayon and cotton in the dyeing of packages.

VAT BORDEAUX HRR POWDER (Patented) and VAT BORDEAUX RR ULTRAFIX DOUBLE PASTE
(Progressive)
Bright and economical in continuous dyeing and pad steam. The printing type is a cheap base color for heavy drapery reds. Suitable for the flash ager.

VAT BRILLIANT GREEN H3G (Patented)
Powder fine for Dyeing and Ultrafix Paste
(Progressive)
In light green shades it is claimed this color produces a fastness to light that cannot be matched.

VAT BRILLIANT ORANGE GR
Powder fine for Dyeing and Ultrafix Paste
(Progressive)
This is claimed to be the brightest vat orange for application prints and to be the only orange that does not tender cotton in exposure to light.

VAT GREY HBR (Patented)
Powder Fine for Dyeing
(Progressive)
This grey has the advantage of covering dead cotton very well.

VAT PRINTING BLUE HFG (Patented)
Ultrafix Paste
(Progressive)
A very bright blue, said to be completely fast to chlorine.

VAT PRINTING BROWN HTM
Ultrafix Paste
(Progressive)
A nontendering vat brown, principally used for dark shades.

VULCAN FAST RED BA PRESSCAKE
(General Dyestuff)
A thick, lumpy presscake in which the pigment is chemically identical with that in Vulcan Fast Red BA Powder. It is said to produce red shades of excellent tinctorial strength and very good fastness to light, acids, and alkalis. It is also said to be fast to hot and cold water, oil, alcohol, and mineral spirits. This product is recommended for the production of lithographic and offset inks, paints, and lacquers, as well as for coloring resins, plastics, and natural and synthetic rubbers.

VULCAN FAST RED BBE PRESSCAKE
(General Dyestuff)
A thick, lumpy presscake in which the pigment is identical with that in Vulcan Fast Red BA Powder. It produces reds that are considerably lighter and more opaque in fulltone and much stronger and considerably bluer in reduction than those of Vulcan Fast Red BA. The fastness properties and uses are essentially the same for both the BA and BBE brands.

VULCAN FAST YELLOW GAN PRESSCAKE
(General Dyestuff)
A pigment of the benzidine type identical chemically to Vulcan Fast Yellow GAN Powder, which is now offered in presscake form. It is recommended for the production of bright greenish-yellow self shades in rubber, lacquers, printing inks and textile pigment-printing formulations, and especially for the production of bright greens in combination with phthalocyanine greens and blues. This yellow is claimed to display very good fastness to light and heat (vulcanizing rubber and curing resins), not to migrate in rubber, and not to bleed in oil, alcohol and plasticizers; its bleed in drycleaning solvents is slight.

WOOL FAST GREY BL (Patented)
(Progressive)
An alizarine dye which does not go radically green in artificial light and is said to be fast to decatizing.

CHEMICALS

ACETOACET-m-XYLIDIDE
(Acetoacet-2,4-Xylidide)
(Carbide and Carbon)
$(CH_3)_2C_6H_3NHCOCH_2COCH_3$. M W 205.25; M P, 89-90°C; Density, 1.238 gm/ml at 20°C; sol in water, 0.5% at 25°C; white to light yellow crystalline solid. Chemical properties: Undergoes the numerous condensation and substitution reactions that characterize compounds containing reactive carbonyl and methylene groups. Suggested uses: intermediate for Hansa Yellow and Benzidine Yellow pigments of improved light stability. Availability: commercial quantities.

ADM ADOL 33
(Archer-Daniels-Midland)
A technical grade of oleyl alcohol. Consists of approximately 85% C_{18}. Cloud point of maximum 68°F; I V = 70-80; hydroxyl value = 200-220. *Uses:* lubricant, softener, delustrant, antifoam, emulsion stabilizer and raw material for ethoxylated alcohol and other textile chemicals. *Availability:* Commercial quantities.

ADM ADOL 40
(Archer-Daniels-Midland)
Typical properties: an unsaturated fatty alcohol derived from castor oil possessing one double bond and two hydroxyl groups. Cloud point below 10°F; flash point °F = 382; viscosity SSU/210 °F = 51; avg mol wt = 283; color = white; boiling range °C 760 mm = 278-328. *Uses:* As raw material for synthesis of textile chemicals. Softener, lubricant, emulsion stabilizer; antifoaming agent; dispersant thickener. *Availability:* pilot plant quantities.

ADM ADOL 42
(Archer-Daniels-Midland)
A straight chain, normal, fatty alcohol derived from animal fat. *Typical properties:* melting point = 35°C; hydroxyl value = 215; Avg Mol Wt = 260.0 viscosity SSU/210 °F = 39.8; distilation range 760 mm = 315-345; color = white. *Uses:* Intermediate for surface active agents — emulsifying agent assistants, textile finishing agents, antifoam agents. *Availability:* pilot plant quantities.

ADM ALPHA OLEFIN 3877A
(Archer-Daniels-Midland)
Typical properties: essentially a mixture of 1—hexadecene and 1—octadecene; Titer = <9°C; Br no. = >65; flash point = 265°F; boiling range = 7.5 mm Hg = 128-158°C. *Suggested uses:* synthesis textile intermediates, surface active agents, resins. *Availability:* pilot plant quantities.

AEROTEX* ACCELERATOR MX
(Cyanamid-Resin)
This product is a catalyst for thermosetting resins that is said to be completely different from conventional organic and inorganic acid producing salts. It is unusually effective with melamine-formaldehyde resins but is also a good catalyst for urea-formaldehyde resins. Its outstanding advantages are claimed to be that it greatly increases the efficiency of melamine-formaldehyde resins; it greatly reduces yellowing and loss in tensile strength due to chlorine bleaching of melamine-formaldehyde resin treated fabrics; it increases the durability of glazing and embossing effects as well as the wrinkle resistance and shrinkage control of fabrics treated with melamine-formaldehyde resins. The use of Aerotex Accelerator MX is said to provide exceptional pad bath stability, reduce bleeding of direct dyes, improve the wash fastness of direct dyes, leave the goods essentially neutral after curing, thus eliminating after-washing to remove acid, and to have less tendency to produce odors on treated fabrics than conventional catalysts. Aerotex Accelerator MX is a water white, free flowing liquid with unlimited storage stability over a wide range of temperatures. It is unaffected by repeated freezings.

* Trade-mark

AEROTEX* ACCELERATOR NF
(Cyanamid-Resin)
Aerotex Accelerator NF is a white, crystalline, water-soluble material said to possess excellent storage stability. Aerotex Accelerator NF was designed for use with Pyroset* Fire Retardant SF Extra, primarily because it produces maximum stiffness and improves the fire retardancy on nylon fabrics. Two percent of Aerotex Accelerator NF based on the weight of the resin solids of Pyroset Fire Retardant SF Extra should be used.

* Registered Trade-mark

AEROTEX* ANTISTATIC
(Cyanamid-Resin)
This product is a water soluble, nonionic, antistatic material. It is said to give excellent protection against build-up of static charges on hydrophobic yarns and fabrics. The product does not discolor the fabric or produce disagreeable odors even at elevated temperatures. Aerotex Antistatic has no softening effect. Although it is normally applied from water solution, it may be applied in solutions of Carbitol, cyclohexanol, carbon tetrachloride or alcohols.

* Trade-mark

AEROTEX* RESIN 802
(Cyanamid-Resin)
This product is a modified urea-formaldehyde resin in liquid form. It has excellent storage stability without requiring refrigeration and is readily soluble in water. Aerotex Resin 802 may be applied to various fabrics. On cotton and rayon it is said to give shrinkage control and wrinkle recovery with a resilient and full, round hand. It is stated that Aerotex Resin 802 may be applied with Permel Resin to give water repellency and spot resistance in addition to the above properties. This combination produces a full, round, resilient worsted-like hand on rayon and rayon-acetate blends. The hand does not break down after repeated washings or handling. The finish does not show mark-off after curing, thereby eliminating the need for calendering in many cases. Aerotex Resin 802 is said to give a stiff resilient finish to nylon fabrics. It is more concentrated than the cream type urea-formaldehyde product and therefore requires less storage space. It is a liquid and therefore can be handled more easily — it can be pumped and be readily dissolved in water without heating.

* Trade-mark

AEROTEX* RESIN UM SPECIAL
(Cyanamid-Resin)
This product is a melamine-formaldehyde resin with improved storage stability, pad bath stability and water solubility. Aerotex Resin UM Special is said to give a soft hand, shrinkage control and wrinkle recovery to cotton and rayon fabrics. Aerotex Resin UM Special may be applied with Permel Resin to give these effects plus water repellency and spot resistance. These finishes are adaptable to cotton knit goods. Aerotex Resin UM Special is widely used in combination with other melamine resins in glazing and embossing work. When used with Aerotex Accelerator MX, the treated fabric has a greatly reduced tendency to discolor or lose tensile strength after repeated chlorine bleach launderings. Aerotex Resin UM Special is compatible with most textile finishing agents.

* Trade-mark

ALKYLENE A
(Hart)
A low-foaming agent claimed to be effective in alkaline solutions. This compound is an anionic phosphated organic alcohol and is said to be stable to strongly alkaline solutions at the boil over long periods of time. It is also used as a dye leveling and dispersing agent.

AMPROZYME LIQUID
(Jacques Wolf)
A product used primarily for desizing starch size on all types of textile fibers but which also finds use in other starch hydrolyses. Amprozyme Liquid is a fluid of brown color containing standardized amounts of amylolytic (starch-solubilizing) enzymes of bacterial origin and also variable amounts of proteolytic enzyme. Amprozyme Liquid is adjusted for rapid high-temperature, desizing operations as well as for normal work. This liquid enzyme is stable during normal storage periods, is readily handled, requires no dissolving, and is said to be the answer to an economical desizing agent.

ANTARON* FC-34
(General Aniline)
Antaron FC-34 is a synthetic fulling agent recommended for neutral, acid and alkaline fulling of woolen and worsted fabrics. It will be found of particular interest for fulling and neutralizing of carbonized woolens in one operation as well as for acid milling of piece goods and hat bodies. Antaron FC-34 is easily rinsed out of the fiber; for removal of large percentages of grease and oil, added detergency may be needed and, in such cases, the use of a nonionic surfactant in subsequent washer scouring is advocated. Antaron FC-34 is a complex fatty amido, amphoteric surfactant, the fatty group being a coconut derivative. It is said to possess good detergency, dispersing and wetting properties. This product has soap-like properties and is said to show excellent stability to acid, alkali and hard water. Antaron FC-34 exhibits both cationic and anionic qualities, the ionization depending upon the pH to which it is adjusted.

* Registered Trade-mark

ANTI FOAM EXTRA S
(Tex-Chem)
A highly active defoaming agent. Anti Foam Extra S is a completely water dispersible product which is stable in alkaline and acid baths. Very small amounts of this product are said to be extremely effective in suppressing foam in operations such as finishing and printing. Since its active ingredients are nonvolatile, the efficiency of Anti Foam Extra S is not impaired by high temperatures.

ANTIFOAM G
(Laurel)
A silicone base antifoaming agent said to be of exceptional efficiency. It is stated that it is effective over a wide range of conditions and gives excellent results in pad boxes, dye boxes, and other wet processing equipment.

ARCCO C 510 HEAT SEAL SOLUTION LAMINANT
(American Resinous)
This is said to be very effective for bonding vinyl films to fabrics including cotton, rayon and nylon. ARCCO C 510 is coated on the fabric by conventional spreader equipment and dries to a nontacky film. It may subsequently be bonded to vinyl at temperatures of 300°F to 350°F. This heat plus the pressure of the embossing or calender roll provides a strong bond. Considerable economy is said to result from the use of C 510 as lamination and embossing are accomplished in one pass as compared to spreader application. In commercial production. Samples available.

ARCCO C 602 POLYETHYLENE OVERPRINT VARNISH
(American Resinous)
A solution coating designed to deposit tough, flexible and abrasion-resistant films on printed polyethylene surfaces. Because of the difficulty of obtaining adhesion to polyethylene, ARCCO C 602 has been adopted by many converters and printers. The compound is applied by standard aniline printing equipment. As supplied, C 602 is gelatinous at low temperatures but when heated to 80° F a workable viscosity develops. Mild agitation may be required. Many customers prefer to reduce the varnish by adding one part of ARCCO C 602-T Thinner to two parts of C 602. ARCCO C 602 dries at room temperature to a tough, nontacky film. Inked surfaces are thereby protected against abrasion and moisture. This affords much needed protection to printed polyethylene surfaces. In commercial production. Samples available.

ARKO FINISH CS
(Arkansas)
A product of the cationic substantive type which was developed primarily as a softener for Orlon knitted fabrics. When properly applied, it is said to impart an extremely soft fluffy hand to Orlon yarns and fabrics. It is recommended that Arko Finish CS be applied as the final rinse in a dye beck or washer type of equipment on the basis of 5.% to 10.% on the weight of the fiber at 120°F, for at least 30 minutes. Arko Finish CS is not compatible with finishes of the anionic type or with anionic detergents or wetting agents, and such agents must be completely removed from the material before the finishing process. In appearance, Arko Finish CS is a whitish emulsion which mixes readily with water at all temperatures, to produce a slightly cloudy solution. It is definitely acid in nature having a pH at working concentrations of 3.3 to 3.5, and is most effective at this range.

ARKO STAT-EX
(Arkansas)
Arko Stat-Ex is useful in many textile applications as an agent for eliminating or minimizing the accumulation of static charges on hydrophobic fibers such as cellulose acetate, Dacron, nylon, Orlon, etc. An outstanding property of the product is said to be its consistent efficiency over a wide pH range (4 to 10) and is thus effective under alkaline, neutral and acid conditions. Arko Stat-Ex is durable to dry cleaning; if laundering is required on garments treated with Arko Stat-Ex, it is a relatively simple matter to carry out a renewal treatment in the last rinse of the laundry cycle. It is stated that, in connection with the use of Arko Stat-Ex on garments or wearing apparel, extensive tests have proved that it is free from toxic and irritating effects on the human skin at the concentrations recommended for use. Arko Stat-Ex is a firm paste of light tan color; it is essentially nonionic. The pH of a 1% solution of Arko Stat-Ex is in the range of 9.0 to 9.5, but it may be adjusted to neutral or acid without impairing its efficiency as an antistatic agent.

AQUACEL 15
(American Aniline & Extract)
This is a 15% solution of polyethylene imine in water. When added to the beater stock it enables the paper manufacturer to use hydrochloric acid in reducing the pH and acts as a bond between urea formaldehyde resins and cellulose.

AQUATONE DX
(Berkshire Corp)
A renewable water repellent. Designed primarily for the textile industry and also adaptable for use in laundries and dry cleaning plants as well as in the household.

AULABRITE® EMULSIFIER PA
(Aula)
A combination of emulsifiers and dispersing agents to be used in the preparation of Aulabrite extenders, particularly Extender 157.

AULABRITE® EXTENDER 157-LC
(Aula)
An extender recommended for use with Aulabrite colors both Series 3000 and 7000. It is customarily prepared in the color shops of the print plants using Aulabrite colors. It is stated that this extender gives prints of exceptional brilliance and laundering resistance.

AULABRITE® EXTENDER 923 AND 925
(Aula)
These two extenders are recommended for use in Aula Chemicals' newly introduced "Hand Rub Washfast System."

AULABRITE® EXTENDER CONCENTRATES 797-799
(Aula)
Newly developed oil-in-water dispersions of a combination of polyester/amide resins and suitably stabilized elastomers for use in the newly developed "Aulabrite Hand Rub Washfast System."

AULABRITE HAND RUB WASHFAST SYSTEM
(Aula)
A new development designed to resist the highest wet abrasion conditions encountered in hand laundering. "The Hand Rub Washfast System" is based on two Extender Concentrates, 797 and 799 which contain a special combination of self-catylized thermo-setting and thermoplastic resins. These extender concentrates are used with either Series 3000 or Series 7000 colors. The colors are prepared for roller printing by blending them in suitable proportions with Extender Concentrates 799 and 797 and with Extender 923. For screen printing of the "Hand Rub Washfast System" Aula recommends the use of Extender Concentrate 799 with Extender 925. The use of Extender Concentrate 797 is optional. The "Hand Rub Washfast System" may be set at curing temperatures considerably below and at curing times considerably shorter than customarily used in pigment printing. It is stated that the desirable properties of the Aulabrite colors such as brilliance, machine running properties, and overall fastness properties are fully maintained in the "Hand Rub Washfast System." Aula's Bulletin No. 15 gives full information on the application of the "Hand Rub Washfast System."

AULABRITE® LOW CROCK ADDITIVE 737
(Aula)
A new member of Aula's auxiliary products to be used either with the Series 3000 or 7000 pigment colors in oil-in-water emulsions of a combination of polyester/amide resins and a stabilized elastomer. When used with Aulabrite colors it is said to result in prints with exceptional resistance to crocking, washfastness, and resistance to dry cleaning.

AULABRITE® STABILIZER 211
(Aula)
A dispersion of solvents, protective colloids, and surface-active agents recommended to be used as an additive to the Aulabrite line of colors when they are used for screen printing. It is claimed to prevent plugging up of screens even under severe conditions and in continuous production.

"AVITONE"* T SOFTENER
(DuPont)
A multi-purpose product said to possess softening, lubricating, re-wetting, and dispersing properties. Chemically, it is an anionic, hydrocarbon sodium sulfonate type composition. Physically, it is a light tan, semi-fluid paste. The pH of 1% dispersion is in the range of 7.5 to 9. Since "Avitone"* T is a new product, all of its possible uses have not yet been explored. However, developments to date have shown that it possesses value as a cotton fabric softener and as a dye dispersing agent in the dyeing of "Dacron"* polyester fiber and blends of "Dacron"* and wool.

* Registered Trade-mark

BASOPAL NA CONC POWDER
(Nova)
A fat-free synthetic detergent for all kinds of textiles. It is a yellowish powder, readily soluble in water. The aqueous solutions are said to possess good stability against alkalis and acids; therefore, this product may be applied in neutral, acidic, or alkaline liquors. It cannot be used as addition to carbonizing, mercerizing, and more highly concentrated creping baths, as it may be totally or partly salted out under these conditions. Its stability against hard water and metallic salts is satisfactory. Noteworthy features of this product are said to be its very good wetting effect in cold and hot baths, its pronounced fat and dirt dissolving power, its strong pigment washing action and its outstanding lathering properties.

BERAPON CS-30
(Berkshire Corp)
Cation-active softener said to be distinguished by the firm, smooth, waxy hand it imparts. Also suitable for use on the finishing of light or delicately colored goods where minimum color change is vital. Among cationic softeners, it is said to be most adaptable to whites because of its minimum yellowing effect.

BERAPON S-10
(Berkshire Corp)
A high grade finishing oil made from a blend of sulfonated vegetable oils combined with specially selected fats. Its outstanding characteristic is said to be its remarkable stability. Is used to impart a silky softness to fabrics and fibers of all kinds. To many fabrics it also adds "body."

BERAPON S-20
(Berkshire Corp)
Claimed to be an excellent anionic softening agent producing a dry but full, round hand on all types of textile fabrics. Does not develop yellow tints in fabrics on aging and has no effect on the light fastness of colors.

BERAPON S-40
(Berkshire Corp)
A new and unusual softening agent for cotton and synthetic fibers. Is not cationic in nature and has no effect on the light fastness of direct colors. Of unique value when applied in conjunction with urea and melamine resin finishes.

BERAPON S-50
(Berkshire Corp)
A sulfonated product claimed to possess a materially higher SO_3 content than ordinary sulfonated tallows. Widely used as a lubricant and softening agent.

BERAPON SFA
(Berkshire Corp)
A dispersion of organic esters, recommended by the manufacturers for use as a scrooping agent on cotton, rayon, acetate or Bemberg knit goods or mixed constructions of these fibers. Also used for finishing rayon tire cord. It is claimed that its effect is markedly superior to the finish obtained by organic acids and resists aging and weathering.

BERATEX #510
(Berkshire Corp)
An unusually low-cost, effective wetting agent and detergent which is said to be resistant to variations in pH and unaffected by metallic salts, lime soap or hard water.

BERATEX DSP
(Berkshire Corp.)
An inorganic resin base delustering and slip-proofing agent. Is said to provide delustering effects on rayon, acetate, silk, nylon and other synthetics. Does not cause chalkiness and therefore can be used on dark shades as well as light. Provides slip-proofing effects and improvement in seam strength on the aforementioned fabrics.

BERKOPON BSW
(Berkshire Corp)
A nonionic detergent and wetting agent that is said to possess excellent brightening properties on wool, silk and nylon. Recommended by the manufacturers as a prescour for woolen goods to attain whiter ground as well as an afterscour for colored woolen goods to clear up whites in plaids and brighten colors.

BERKOPON CFA
(Berkshire Corp)
An excellent dye fixative that is said to have no effect on the hand or color shade of dyed fabrics. It is stated that it: improves fastness of direct colors to washing and prevents bleeding of prints into discharges or grounds; increases fastness to perspiration and color fast-

ness to wet-ironing and wet-processing; and retains color sharpness in cross-dyeings.

BERKOPON HGS
(Berkshire Corp)
A concentrated synthetic scour plus solvents. Claimed to be an excellent fulling and scouring agent for goods carbonized in the grease. Recommended for scouring goods containing large amounts of mineral oil.

BERKOPON LD #35
(Berkshire Corp)
Claimed to be a highly effective stripping aid for vat, sulfur and direct dyeings or prints on cotton, and rayon materials. It is stated that it is a water-soluble, amber-colored liquid, stable to hard water, acid and alkali in concentrations encountered in textile processing.

BERKOPON RCW
(Berkshire Corp)
A nonionic detergent and wetting auxiliary which is said to possess excellent whitening properties on vegetable fibers such as cotton, linen, hemp and also viscose rayon in neutral or weakly alkaline baths.

BERKOPON RW-100
(Berkshire Corp)
Claimed to be a highly effective anionic wetting and rewetting agent suitable for use in both hot and cold solutions. This new surfactant is said to produce only a moderate amount of foam and is therefore suitable for use in high speed continuous processing equipment also in long liquor work on raw stock, yarns, hosiery and fabrics.

BERKOPON SAN
(Berkshire Corp)
A concentrated alkylarylsulfonate flake of definite and constant composition. Unaffected by the presence of acid, alkali, metallic salts or hard water. It wets-out at very low concentrations, cleans by emulsification and insures rapid rinsing.

BERKOPON TWA
(Berkshire Corp)
Primarily a nonionic leveling agent used to produce level dyeing on tippy wool and wool blends along with good fulling properties and brightness of shade.

BLANCOPHOR* FFG
(General Aniline)
Blancophor FFG is an optical whitening agent designed primarily for application on wool but is also effective for brightening nylon, Orlon and acetate rayon as well as mixed fiber yarns and fabrics. Blancophor FFG imparts a blue-violet shade of fluorescence on the bleached white animal or synthetic fiber. This product is suitable for long liquor, mangle and pad application. It possesses good affinity for various fibers and exhausts uniformly. Treated fabrics do not yellow on high temperature drying. A particular benefit of Blancophor FFG is that it discourages yellowing of nylon during the heat set operation.

* Registered Trade-mark

BLANCOPHOR* HS-71 and BLANCOPHOR* HS-76
(General Aniline)
The Blancophor HS brands are highly water-soluble optical whitening agents used for producing blue-violet brilliancy on bleached cotton and rayon yarns and fabrics. Because of their exceptionally good solubility in water, they will be of particular interest for pad and mangle applications. The Blancophor HS brands can be used alone or in combination with usual bluing agents and in finishes made up with resins, starch, dextrin, etc. Blancophor HS-71 and HS-76 are relatively slow exhausting and are well suited for brightening cotton yarn in pressure machines where good leveling is required. These brighteners can be exhausted onto the cellulosic fibers with a small addition of salt. The two products are interchangeable in all operations by using 23 parts of Blancophor HS-76 to replace 100 parts of the weaker Blancophor HS-71.

* Registered Trade-mark

BLEACHIT I
(Nova)
A bleaching agent. It is supplied as a stable white powder, easily soluble in water. The aqueous solutions which react weakly alkaline shortly after being prepared, are stable. The action is due to its strong reducing power, whereby it combines with oxygen and forms bisulfite. Many natural colors are destroyed by reduction, others are converted into a more easily soluble form and then can easily be rinsed out of the goods. Furthermore it is said to completely destroy hypochlorite residues and remove iron salts from the fiber.

BLEACHIT IA
(Nova)
For bleaching and brightening animal, vegetable, and synthetic fibers. It is supplied in the form of a stable, yellowish powder, which is readily soluble in water. The aqueous, slightly opalescent solutions of Bleachit IA react alkaline shortly after they have been prepared, and have good stability. The effect of Bleachit IA is based upon its strong reducing properties and its power of imparting to the treated material the property of converting the ultra-violet rays of daylight into visible blue rays, and reflecting them in this form. As a result of this fluorescent effect, Bleachit IA thus is said to give a bleaching and brightening effect which is additional to, and surpasses, a mere reduction bleaching effect. In this manner, an exceptionally pure and brilliant white is achieved.

B-TEX
(Fancourt)
A polyethoxy alkylarylsulfonate designed as a penetrant and wetting agent for the bleaching of textiles with peroxide. It is claimed B-Tex stabilizes the bleach liquor far better than the usual alkali salts, however, it may be used with the alkali phosphates or silicates. By the use of B-Tex, it is reported better whites are obtained due to greater penetration of the bleach solution into the fiber and consequently the time of the bleaching cycle is shortened. B-Tex contains a water soluble fluorescent whitening agent which exhausts on the fiber during the bleaching operation producing a pure bluish white.

BURKOTE A-102
(Burkart-Schier)
Latex based splicing agent for cotton, rayon and other yarns to obtain knot-free splices. One of the Burkote series of compounded latices for coating and impregnating textiles.

N-BUTYL CYCLOHEXYLAMINE
(Carbide and Carbon)
$C_4H_9NHC_6H_{11}$. MW, 155.28; Sp G, 0.8439 at 20°/20°C; BP, 209.5°C (760 mm); VP, 0.2 mm. Hg at 20°C; Fr P, —45°C; Visc, 2.2 cps at 20°C; sol in water, 0.14% at 20°C; sol. water in, 4.5% at 20°C; completely soluble in acetone, benzene, ethyl ether, heptane, methanol, and carbon tetrachloride; odor, mild, ammoniacal; color, water white. Chemical properties: undergoes reactions typical of secondary amines. Suggested uses: alkaline organic solvent; extractant for acidic materials; acid acceptor; intermediate for pharmaceuticals, rubber chemicals, and corrosion inhibitors. Availability: research quantities.

CALCOFLUOR WHITE MST
(Cyanamid-Dyestuff)
This product is a textile whitening agent. It has a blue fluorescence when applied to cellulosic fabrics and viewed under ultraviolet light. Calcofluor White MST has several outstanding properties. It is very insensitive to pH. It can be applied from a neutral bath or from an alkaline bath having a pH as high as 10.0 and can also be applied from a very slightly acid bath such as required in a starch padding operation where the starch solution often has a pH of 6.0. It is also very insensitive to temperature in that it can be applied anywhere in the range of 100°F to 212°F. Thus it can be dyed in package machines and other high temperature applications.

CALCOFLUOR WHITE 2RT
(Cyanamid-Dyestuff)
Calcofluor White 2RT is a textile whitening agent which has been added to Cyanamid's line to extend the range of properties available. Its action is similar to that of the other Calcofluor Whites in that it displays a blue fluorescent when applied to fabrics and viewed under ultraviolet light. In light containing ultraviolet rays this blue fluorescence, while it cannot be seen as such, is still present and acts to enhance the whiteness of white materials or brighten the shades of many pastels. The fluorescence of the Calcofluor White 2RT may be considered to be a slightly reddish blue in comparison to the Calcofluor White MST which is a more neutral blue.

"CAPRACYL"* LEVELING SALT
(Du Pont)
"Capracyl"* Leveling Salt is of interest for improving the levelness of "Capracyl"* dyes on both wool and spun nylon. It is also recommended for producing dyeings of greater uniformity with acid dyes and has been successfully employed with many neutral dyeing and chrome dyes for obtaining level dyeings on wool piece goods. It is stated that wool carpet yarn and rawstock dyed to very level and well penetrated shades have resulted from the use of a small amount of "Capracyl" Leveling Salt in the dyebaths. Coarse carpet yarns which normally are dyed from five to six hours with ordinary acid dyes are completely penetrated in about one hour. Another interesting use for the product is in dyeing blends of "Orlon"* type 42 acrylic staple and wool where it prevents staining of the wool by cationic dyes. It is also advantageous in one-bath procedures where "Orlon"* and wool are dyed simultaneously and for scouring "Orlon"* and blends of "Orlon"* and wool both before and after dyeing.

* Registered Trade-mark

"CARBOWAX"* POLYETHYLENE GLYCOL 20M
(Carbide and Carbon)
A high-molecular weight polyethylene glycol. MW, 15,000-20,000 approx; softening point, 59°-61°C; melt visc, 900-1100 poises at 210°F; Visc of 25% aqueous sol, 1549 cps at 68°F, 553 cps at 100°F; sol in water, 55 gm/100 ml at 25°C; color of 25% aqueous sol, 150-200 Pt-Co; pH of 5% aqueous sol, 5-6. "Carbowax" Compound 20M is a water-soluble solid that forms stronger and more flexible films than the commonly available lower molecular weight polyethylene glycols. It is highly water-soluble, slightly soluble in aromatic hydrocarbons, and insoluble in aliphatic hydrocarbons. It is compatible with nitrocellulose and methyl cellulose, but only partially compatible with polyvinyl alcohol, carboxymethyl cellulose, sodium alginate, and hydroxyethyl cellulose. Suggested uses: as a thickening, binding, and suspending agent in textile, paper, ceramic, and specialty product applications. Availability: research quantities.

* Trade-mark

CATALYST P
(Tanatex)
A new type catalyst used for silicone water repellent resin mixes. Catalyst P is said to form a highly stable resin mix. The product is said to be useful with all silicone water repellent resins presently on the market.

CATALYST RP
(Refined)
A fast-curing catalyst for thermosetting resins of the urea-formaldehyde and melamine-formaldehyde type. It gives resin solutions greater stability and bath life. It is said to improve the hand and quality of the treated fabric and reduce the possibility of odor development.

"CELLOSIZE"* HYDROXYETHYL CELLULOSE WP-3
(Carbide and Carbon)
A white to light tan, water-soluble, free flowing powder. Visc of 5% aqueous sol, 250-350 cps at 20°C; pH of 2% aqueous sol, 6-8. Suggested uses: as a protective colloid and thickener with applications in textiles, cosmetics, paints, adhesives, and ceramics; of particular interest as a protective colloid and thickener in polyvinyl acetate and other synthetic resin emulsions. Availability: commercial quantities.

* Trade-mark

"CELLOSIZE"* HYDROXYETHYL CELLULOSE WP-09
(Carbide and Carbon)
A white to light tan, water-soluble, free-flowing powder. Visc of 5% aqueous sol, 50-150 cps at 20°C; pH of 2% aqueous sol, 6-8. Suggested uses: as a water-soluble, film forming agent and colloidal stabilizer with applications in textiles, plastics, cosmetics, paints, adhesives, and ceramics. Of particular interest as a stabilizer for emulsion polymerization of vinyl acetate and other monomers, and as a protective colloid in the final resin emulsion. Availability: commercial quantities.

* Trade-mark

CERALOID 356
(Colloids)
After-waxing compound wax containing antistatic agents of low, unsaponifiable content. Easily emulsified and scourable, Ceraloid 356 and its modification, 356 WD (water-dispersible), are employed in the after-waxing of nylon, Dacron, sized and unsized warp yarn for superior weaving. Data sheets available. For scouring after-wax materials, the manufacturers recommend Synterge 750.

CERAMOL
(Aceto)
An emulsifier manufactured as a carefully balanced blend of cetyl and stearyl alcohols and higher alcohol sulfates. It is stated that, since the sulfated alcohols are oil-in-water emulsifiers and the unreacted alcohols are water-in-oil emulsifiers, the balanced mixture results in a product with an extremely wide range of applications.

CET
(Onyx)
A water-soluble, cross-linking reagent for cellulose. It is said to achieve unusual stabilizing effects on rayon and cotton, with a minimum of embrittling or stiffening. The crease-resistance and shrinkage control are said to even under severe laundering conditions.

CHROMIUM CHEMICALS
(Fiber Chemical)
Fiber Chemical's chromium chemicals are produced in two series: the I G (industrial grade), and the TP (technically pure) grade. Following are new products available:
FCC Chromic Sulfate—for use as a mordant and tanning agent.
FCC Chromic Sulfate T P 7½ Powder—
FCC Chromic Nitrate T P 50%—
FCC Chromic Nitrate Acetate T P—for use in printing.
FCC Chromic Chlorides—for use in preparation of chromium salts and as a mordant.
FCC Chromic Potassium Fluoride—for use in dyeing.
FCC Chromic Formate—for use as a tanning agent, mordant and in the manufacture of chromium chemicals.
FCC Chromic Acetate—for use as a mordant in dyeing and printing and in the manufacture of catalysts.

CONCO AAS 95
(Continental)
An arylalkylsulfate containing 95% organic active materials.

CONCO DACROSIST OA
(Continental)
A vehicle and carrier, for Dacron dyeing which is said to form a completely stable emulsion in the dye bath and to yield high color values.

CONCO FINISH FR
(Continental)
A flame retardant for cottons and rayons and a weighting agent compatible with gums, oils, and other anionic and nonionic finishes.

CONCO PENETRANT TC
(Continental)
A new, modified sulfated ester with instantaneous wetting and rewetting for all fibers and fabrics at all temperatures. Said to be invaluable in Sanforizing.

CONCO REPELLANT Z
(Continental)
A one-product zirconium water repellant said to possess top spray rating.

CONCO SEQ CONC
(Continental)
A new organic sequestering agent of high concentration and said to effectively chelate calcium, magnesium, iron, and the trace metals.

CONDENSATE S
(Continental)
A 100% organic synthetic detergent of the fatty acid amine series said to possess unusual lime, alkali, and acid stability.

CYCLAMINE B
[Methylcyclohexylmethyl Amine-(mixed isomers)]
(Carbide and Carbon)
$C_8H_{15}NH_2$. MW, 127.2; Sp G, 0.8934 at 20°/20°C; BP, 185.6° (760 mm); VP, 0.7 mm Hg at 20°C; Fr P, sets to glass below —90°C; sol in water, 0.4% at 20°C; sol water in, 39% at 20°; Visc, 2.3 cps at 20°C; odor, sharp, ammoniacal; color, yellow. Chemical properties: cyclic eight carbon primary amine. Enters into typical reactions of primary amines. Suggested uses: preparation of oil demulsifiers, corrosion inhibitors, surface-active agents, oil additives, and rubber chemicals. Availability: research quantities.

CYCLAMINE EB
(2,5-Endomethylenecyclohexylmethyl Amine)
(Carbide and Carbon)
$C_8H_{13}NH_2$. MW, 125.2; Sp G, 0.9419 at 20°/20°C; BP, 185.9°C; (760 mm); VP, 0.7 mm Hg at 20°C; Fr P, sets to glass below —90°C; sol in water, 0.24% at 20°C; sol water in, 41.3% at 20°C; Visc, 4.3 cps at 20°C; odor, characteristic amine; color, pale yellow. Chemical properties: cyclic eight carbon primary amine. Undergoes typical reactions of primary amines. Suggested uses: preparation of oil demulsifiers, corrosion inhibitors, surface-active agents, oil additives, and rubber chemicals. Availability: research quantities.

DECERESOL* WETTING AGENT NI CONC
(Cyanamid-Resin)
This product is a 100% active, nonionic wetting agent said to possess excellent wetting, emulsifying, dispersing and detergent power. It has a high salt tolerance and excellent compatibility with acidic, alkaline, cationic or anionic baths. It is claimed that Deceresol Wetting Agent NI Conc represents a product with the optimum balance of hydrophobic and hydrophylic groups to provide maximum efficiency in textile processes where a surface active agent may be used. This product is said to show high detergency value as a kiering assist for cottons, as a scouring agent for viscose and synthetics, as a scouring agent on raw or finished wool, and for soaping printed goods. It is effective in all types of dyeing and dye stripping processes. It may be used in acid or enzyme desizing baths as well as chlorine type or continuous hydrogen peroxide bleaching systems. Its stability in acids makes it a good penetrant and allows a reduction in the amount of acid normally used in the wool carbonizing process. Deceresol Wetting Agent NI Conc is stable in storage and is not affected by freezing. It does not discolor or impart a disagreeable odor to the treated fabric.

* Trade-mark

DEFOAMER #500
(Berkshire Corp)
A concentrated silicone base defoamer for textile processing application. Recommended by the manufacturers for reduction of foam in dyeing operations.

DEFOAMER F-947*
(Pioneer)
A 100% active defoaming agent in form of a soft wax which is easily dispersible in hot water, to give a nonionic emulsion. Recommended by the manufacturers for all textile operations where foam is undesirable.

* Patent applied for

DELECTROL 379
(Colloids)
Claimed to be nonyellowing, nonionic, antistatic oil, 100% active, readily emulsifiable, stable to acid-alkali, Delectrol 379 is recommended by the manufacturers for coning, throwing, finishing and after-oiling of sized synthetic yarns, worsted, nylon, Dacron, and Orlon. May be added to worsted or woolen oils to reduce static or excessive drag in yarns. Data sheet lists complete description.

DEPCO* BLEACH ASSIST
(De Paul)
A newly-developed stabilizer designed for use with sodium chlorite bleaching. Its primary purpose is to protect against corrosion and diminution of offensive smell. The product is completely soluble in water, nontoxic and substantive. Depco* Bleach Assist is said to control development of chlorine dioxide. Losses of bleaching agent are thereby reduced and better whites are thus obtained. It is especially recommended by the manufacturer for use in the bleaching of Dacron, Orlon, nylon and cotton yarns.

* Registered Trade-name

DEPCO* FIX N
(De Paul)
A new type of cationic resin fixative for direct dyes. Very soluble in cold water. It is said to be an effective fixative for direct dyes, cottons and rayons. Little change in shade and lightfastness is caused when Depco Fix N is used in aftertreatment. It is claimed that it completely prevents migration of color and staining.

* Registered Trade-name

DEPCOGEL* 3X
(De Paul)
A new anionic detergent and wetting agent for use on all natural and synthetic fibers, which is said to have outstanding resistance to hard water and excellent stability to acids and alkalies.

* Registered Trade-name

DEPCOLIN*
(De Paul)
A buffering agent providing sufficient acidity for rapid oxidation of the aniline to aniline black, which is said to prevent fiber damage. Steaming time is reduced to the minimum.

* Registered Trade-mark

DEPCOLON* RU
(De Paul)
A new type of substantive alkali stable softener, compatible with anionic and nonionic finishes. Very easily dispersed in warm water and is said to offer a great resistance to washing, dry-cleaning, discoloration and odor development. It is claimed that: it does not affect the shrinkage; has no adverse effect on gas fading on acetate colors; has less tendency to adversely affecting light fastness or to discolor white goods; has no negligible tendency to scorch under a hot iron; and produces superior smoothness of hand.

* Registered Trade-name

DEPCOSET* RI
(De Paul)
This product is said to provide durable stabilization and crease resistance. It is claimed to be the ideal resin for embossing and glazing on all types of durable mechanical finishes.

* Registered Trade-name

DERGOPAL FP
(Arkansas)
An optical bleach composition developed specifically for use with flame retardant finishes, which often impart a slight yellow cast to white cotton and rayon fabrics. It is highly compatible with most flame retardant compositions at the working concentrations ordinarily employed. It is stated that, when used in proper proportions, the yellow cast is completely overcome, thus producing a brilliant white on the fabric. Dergopal FP has been widely used with Arko Flameproofing Compound AS on rayon and cotton pile fabrics with highly satisfactory results. In general ,a concentration of 1.% to 2.% of Dergopal FP is recommended in a bath containing 10.% to 15.% of Arko Flameproofing Compound AS.

DERGOPEN RN
(Arkansas)
A wetting and re-wetting agent said to possess a very high order of efficiency. It is nonionic in character and is highly compatible with most anionic and cationic products. It is recommended particularly as a re-wetting agent in applications where the necessity of preventing any yellowish discoloration on white goods is of importance. For this purpose a 1.% concentration in the application bath is recommended. As a wetting agent, it is efficient over a wide pH range from strongly acid up to moderately alkaline, at concentrations of 0.1% or less. Dergopen RN is a water-white viscous liquid which dissolves rather slowly in water thus requiring adequate mixing. It produces a brilliantly clear solution which has a strong tendency to foam. In applications where foaming is objectionable, the use of DERGOPEN RD, which is a modification of this product with minimum foaming properties, is recommended.

DEXOPAL 99
(Dexter)
A dyeing assistant and scour, Dexopal 99 was developed specifically for use in the Burlington nylon tricot dyeing machine. Through the use of this agent, it is unnecessary to add solvents to the liquor when scouring and dyeing synthetic fibers in the Burlington machine, the company claims. It is said to promote levelness and penetration and also to keep dirt and grease emulsified. It has been found effective in the reduction of air pockets which lead to uneven dyeing, Dexter claims, and foaming is cut down to the minimum by Dexopal's antifoam characteristics.

DEXTROL FAST SALT M
(Dexter)
Dextrol Fast Salt M, a nonionic agent, is a dyeing assistant for acid metalized dyestuffs on wool which is said to reduce the amount of sulfuric acid normally needed, thereby holding to a minimum any loss of tensile strength of the fiber.

"DIAPENE"* PFN
(Quaker)
A modified amine aldehyde resin. This thermosetting resin is said to impart stiffness, crispness, and body to nylon fabric, such as marquisette. It is used to produce a parchmentized taffeta or bouffant finish, and is said to give exceptionally fine whites. It is applied and cured in the usual way for thermosetting resins.

* Registered Trade-mark

"DIAPENE"* VAL
A high solids vinyl resin finish that is said to minimize sticking to cans or tenter clips. It is heat stable, so that it may be boiled up alone or with starch in the preparation of the finisning formulation. It is said to give a full-bodied, smooth, nondusting finish. Its exceptional clarity on the fabric is said to assure maximum color value.

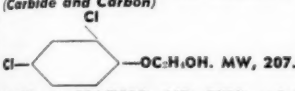
* Registered Trade-mark

"DIAPERM"* SN
(Quaker)

A nonionic, substantive softener for imparting softness, fullness, and surface smoothness to a wide variety of fabrics and yarns. Its use is said to be indicated where a substantive softener is desired, and where minimum effects on whites and dyed fabrics is imperative. It is stated that it is particularly useful for package application to dyed or bleached cotton yarn where its controlled substantivity insures uniform deposition of the softener throughout the package. With thermosetting resin finishes or shrinkage control reactants, this softener will not contribute to chlorine retention.

* Registered Trade-mark

2,4-DICHLORPHENYL "CELLOSOLVE"*
(Carbide and Carbon)



Cl—C$_6$H$_3$—OC$_2$H$_4$OH. MW, 207.06; Sp G, 1.429 at 30°/20°C; MP, 58°C; sol in water, 0.2% at 30°C; soluble in acetone, benzene, carbon tetrachloride, ethyl, ether, and methanol; only slightly soluble in heptane. During the past year this product has created interest as a dye carrier for Dacron polyester fibers. It is a water-insoluble solid which is used in the form of an emulsion. Availability: commercial quantities.

* Trade-mark

DICYCLAMINE 8
[Di-(Methylcyclohexylmethyl) Amine-(mixed isomers)]
(Carbide and Carbon)

$C_{16}H_{30}NH$. MW, 237.4; Sp G, 0.9366 at 20°/20°C; BP, 213°C (50 mm Hg); VP, <0.01 mm Hg at 20°C; Fr P, sets to glass below —70°C; sol in water, <0.01% at 20°C; sol water in, 0.51% at 20°C; Visc, 15.7 cps at 20°C; odor, mild, ammoniacal; yellow wax-like material. Chemical properties: dicyclic sixteen carbon secondary amine. Enters into typical reactions of secondary amines. Suggested uses: preparation of oil demulsifiers, corrosion inhibitors, surface-active agents, and rubber chemicals. Availability: research quantities.

DICYCLAMINE E8
[Di-(2,5-Endomethylenecyclohexylmethyl) Amine]
(Carbide and Carbon)

$C_{16}H_{30}NH$. MW, 231.4; Sp G, 0.9587 at 60°/20°C; BP, 169°C (10 mm Hg); VP, <0.01 mm Hg at 20°C; Fr P, 50°C; sol in water, <0.01; Visc, 11.3 cps. at 60°C; odor, characteristic amine; yellow wax-like material. Chemical properties: dicyclic sixteen carbon secondary amine. Enters into typical reactions of secondary amines. Suggested uses: preparation of oil demulsifiers, corrosion inhibitors, surface-active agents, and rubber chemicals. Availability: research quantities.

DISPERSAL 995
(Colloids)

A new, nonionic, emulsifying, degreasing and scouring agent. Dispersal 995, available as a concentrated, clear, viscous liquid, is said to offer unusual compatibility with processing chemicals, stability to acids and alkalies. Data sheet available.

DISPERSAL 1278
(Colloids)

Concentrated polyglycol ester said to have excellent stability to strong acids. Used as a dispersing agent, wetter, or lubricant in acid operations such as crabbing; in synthetic or wool dyeing or as an emulsifier and wool protective agent in acid scouring. Dispersal 1278 is a 100% concentrate; also available as Dispersal 1278/3, a 33-1/3% solution.

DISSOLVING SALT B
(Norva)

A dissolving and fixing auxiliary principally for textile printing. Having a dispersing effect, it is said to accelerate the migration of the dyestuff through the outer surface of the particles of the thickening and prevent to a great extent the adsorption of the leuco substances by the starch thickening. The use of this product therefore is said to increase the color value and give more level prints with a wide range of vat dyestuffs. The addition of Dissolving Salt B is recommended by the manufacturer for improving the solubility of some of the soluble vat dyestuffs. White discharges on Naphthol AS and Beta-Naphthol dyeings are said to be improved by an addition of Dissolving Salt B to the usual white discharge pastes. When used for colored discharges with vat dyestuffs on dyeings of acetate silk, it will also improve the colored discharge effect. It is in many cases beneficial for the penetration of the printing colors.

DRAWAX 930 OR 931
(Colloids)

These products are Drawax 936 in less soluble forms. Used in the rubber, plastic, or metal trades as a lubricant and mold release agent. Data sheet available.

DRAWAX 936
(Colloids)

A new, synthetic wax said to be of high lubricity, high melting point, and excellent adhesion to yarns or fabrics. It is stated that it has unusual stability and is nonyellowing at extremely high temperatures. Compatible with starch, all resin formulations, glues, caseins, and all types of finishes where lubricity is required and softness is not paramount. It is claimed to be excellent to improve sewing of resin-treated goods and to eliminate needle breakage. Does not impair strength of films.

DRULAN LAV
(Drew)

A special protein condensate type of product prepared from carefully selected materials. Recommended for use in fulling wool and other animal hairs, under neutral conditions to preserve strength. Overcomes hard water conditions, removes high mineral oil content from reworked wools, and facilitates the production of level dyeing from pulled wools. Used by a specific technique.

DRUSIL 30
(Drew)

A durable type silicone base water repellent effective for all fibers. May be used as is or in conjunction with urea formaldehyde and melamine resins either afterwashed or not afterwashed.

Drew laboratories recognize that ordinary chemical processing equipment is not adequate from the standpoint of particle size and emulsion stability. Drusil 30 has been produced with an eye towards improving these two properties.

DRUTERGE PE
(Drew)

A balanced emulsifier/solvent/detergent mixture for scouring the new hydrophobic fibers. Particularly to remove ether soluble substances and facilitate the bonding of dyestuff and finish to the fiber.

Effective in removal of black oil, graphite, black knots, and newer types of warp sizes and after waxes from newer fibers.

DULLER CAS
(Berkshire Corp)

A cation-active pigment duller with the property of providing a materially softer hand than ordinary agents of this type. Recommended by the manufacturer for dulling and softening of all types of rayon, acetate and nylon piece goods (hosiery excepted).

DULLER WC
(Laurel)

A cationically dispersed pigment duller in paste form. It is said to be very efficient and convenient to use. Recommended by the manufacturer for nylon, rayon and acetate fabrics. It is highly resistant to mark-off.

DUOWET
(Burkart-Schier)

Sulfated ester, sodium salt, high speed wetting and re-wetting agent with minimum foam. Stable in acid, neutral, and mildly alkaline baths . . . unaffected by hard water. Available in various concentrations as required.

DU PONT PAPER WHITE BN
(Du Pont)

A fluorescent white dye especially designed for improving the whiteness or brilliance of white papers. It is very effective on all bleached furnishes such as sulfite, kraft, alpha and rag. On furnishes containing more than 15% groundwood or 25% unbleached sulfite it is much less effective, and is practically ineffective on bleached groundwood. Groundwood pulps and unbleached furnishes have a tendency to absorb the ultra-violet rays and minimize the fluorescence imparted. It can be added to the pulp either in the dry form or from solution, and is retained well with size and alum or with alum alone. Although three pounds of the product per ton of air dried pulp will improve the brightness, the quantities generally used for producing high grade white papers are in the range of 4 to 10 pounds per ton of paper. These quantities may vary to obtain almost any degree of visual brightness. Du Pont Paper White BN is being successfully used in bond and writing papers, white lined board, bag paper, boxes and cartons, tissue, waxed, blotting and light-weight coating papers.

DYEING ASSISTANT #54
(Ciba)

Was developed for dyeing Dacron* staple fiber in the form of loose stock on tops. Dyeing Assistant #54 is said to offer advantages over paraphenylphenol in that it is not necessary to pre-dissolve with hot caustic soda, and to acidify between the pre-treatment and the dyeing; Dyeing Assistant #54 can be added directly to the dyebath. In addition, Dyeing Assistant #54 leaves the Dacron* with a soft and lofty hand.

* Registered Trade-mark

DYNADYE NT
(Amalgamated)

A new type of carrier for the dyeing of Dacron and blends thereof. Is said to be nontoxic, nonirritating and presents no problem of stream pollution. Requires no special handling precautions, is readily dispersible in water, has no adverse effect on light fastness. Color yield is excellent.

ECCO-847
(Eastern)

An improved light colored sulfonated tallow said to be of exceptionally high SO_3 content. This product will give clear solutions at 5% concentration and is said to have excellent heat resistance (no yellowing for 60 seconds at 400°F). Approaches the hand of the typical softener on applications. Samples on request.

ECCO-W-88
(Eastern)

A low cost but claimed to be a highly efficient liquid wetting agent for use in general textile applications. It is recommended by the manufacturers for those uses where high speed wetting-out is desired and cost is a factor. Samples on request.

ECCOPEL
(Eastern)

A renewable single package wax emulsion water repellent claimed to be outstanding for the stability of its emulsion during storage and during use on modern high speed equipment. It is particularly recommended by the manufacturers where stability to beating and low foam is desired. It is stated that 100% spray ratings at low concentrations (5-10%) may be obtained on cotton, wool and rayon. Samples on request.

ECCOWAX UL-100
(Eastern)

100% active base claimed to yield a superior nonyellowing, soft hand on cotton or rayon. It is said to be excellent for use on high speed, high temperature padders and driers. Easily dispersible in hot water. Can be supplied as cationic or nonionic in any concentration. Samples on request.

"EKALINE" WA
(Sandoz)

Ekaline WA is a nonionic leveling and retarding agent. It combines with the dyestuff and only liberates the color at a controlled rate while the bath temperature is gradually increased. The wetting power of Ekaline WA is sufficient to eliminate the necessity of using a special wetting agent in the dyebath. It is stated that, at elevated temperatures, the wetting and penetrating power of Ekaline WA becomes very high.

EMBOSET NR*
(Metro-Atlantic)

A highly concentrated thermosetting resin solution, which was developed primarily for the finishing of nylon sheers, taffetas, and similar fabrics, where a durable, crisp, resilient hand is desired. It is also said to be very effective when used on rayon acetate blends, acetate and silk, where added body and stiffness are required in the finished fabric. It is stated that Emboset NR has excellent storage stability and solutions of the product containing the recommended amounts of catalyst have unusually long bath life. The product is applied and cured by the same general methods normally used with urea or melamine formaldehyde resins.

* Registered Trade-mark

EMKACIDE GFI-40
(Emkay)

A durable type gas fading inhibitor for acetate colors. It is used in the dye bath to give maximum protection.

EMKALAR DA
(Emkay)

A carrier for Dacron dyeing. Product is a 100% active dispersion containing methyl salicylate and is claimed to be highly effective for obtaining dark level shades on Dacron at temperatures below the boil.

EMKALON H-460
(Emkay)

A substantive anionic softener in paste form, soluble in warm water and said to have excellent stability in acids, alkalies, or neutral baths. It is compatible with thermo-setting type

resins of the urea-formaldehyde or melamine types. It is said to have outstanding resistance to yellowing under high heat.

EMKASIZE CT CONCENTRATE
(Emkay)
A 100% active cotton warp slashing preparation. It is a special blend of lubricants, binding agents, penetrants, and anti-mildew agents compatible with starch solutions. It contains no metallic salts.

EMKASET
(Emkay)
A nitrogen-containing formaldehyde resin recommended by the manufacturers for shrinkage control and for stiff finishing of nylon fabrics.

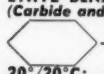
EMKASTAT SW
(Emkay)
An amber-colored oil containing 100% active ingredients having a pH of 8. It is said to be highly effective as an antistatic agent in the finishing of synthetic fibers such as nylon, Dacron and Orlon.

EMKATERGE LQ AND PD
(Emkay)
These are liquid and powder preparations mixed together to make a graphite remover for cleansing of nylon lace.

ENERGETIC* W-100
(Armour)
Like its companion products Energetic & Energetic S, Energetic W-100 is a liquid nonionic synthetic detergent. It is 100% active, water-white, almost odorless liquid. It is claimed that, because of its exceptional wetting properties and good detergency, it is useful for many wet finishing operations in the textile fields. It is especially recommended by the manufacturers for dyeing, bleaching, package dyeing, wool scouring and desizing. Energetic W-100 is available in 5 and 55 gallon steel drums.

* Registered Trade-name

ETHYL BENZENE
(Carbide and Carbon)



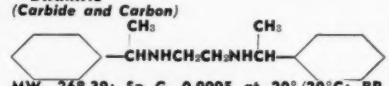
—C_8H_8 MW, 106.16; Sp G, 0.8684 at 20°/20°C; BP, 136.2°C (760 mm); Fr P, —95.0°C; sol in water, 0.02% at 20°C; sol water in, 0.05% at 20°C; Fl Pt, 85°F (open cup tester). A useful solvent in which to carry out vinyl polymerizations because it promotes the formation of low molecular weight products useful as adhesives and in coating applications. It is also suggested as an intermediate for the synthesis of dyestuffs and as an extraction solvent. Availability: commercial quantities.

N-ETHYL CYCLOHEXYLAMINE
(Carbide and Carbon)
$C_2H_5NHC_6H_{11}$. MW, 127.22; Sp G, 0.8477 at 20°/-20°C; Fr P, —43.6°C; BP, 164.9°C (760 mm); VP, 1.8 mm Hg at 20°C; Visc, 1.5 cps at 20°C; sol in water, 1.5% at 20°C; sol water in, 23% at 20°C; completely soluble in acetone, benzene, ethyl ether, heptane, methanol, and carbon tetrachloride; odor, mild, ammoniacal; color, water white. Chemical properties: undergoes usual reactions of secondary amines. Suggested uses: alkaline organic solvent; extractant for acidic materials; acid acceptor; intermediate for pharmaceuticals, rubber chemicals, and corrosion inhibitors. Availability: research quantities.

N-2-ETHYLHEXYL ANILINE
(Carbide and Carbon)
$C_6H_5NHCH_2CH(C_2H_5)C_4H_9$. MW 205.33; Sp G, 0.9119 at 20°/20°C; BP, 194°C. (50 mm); VP, <0.01 mm Hg at 20°C; Fr P, sets to glass below —70°C; sol in water <0.01% at 20°C; sol water in, 0.1% at 20°C; Visc, 7.4 cps at 20°C; odor, mild; color, light yellow. Chemical properties: Undergoes most reactions typical of secondary aryl and alkyl amines; mildly alkaline. Suggested uses: As solvent and acid acceptor; preparation of derivatives that show better hydrocarbon solubility and lower volatility than similar derivatives of the lower alkyl anilines; these derivatives should be useful as dyestuffs, pigments, corrosion inhibitors, oil additives, pesticides, and rubber and textile chemicals. Availability: commercial quantities.

N-2-ETHYLHEXYL CYCLOHEXYLAMINE
(Carbide and Carbon)
$C_4H_9CH(C_2H_5)CH_2NHC_6H_{11}$. MW, 211.38; Sp G, 0.8488 at 20°/20°C; BP, 270.3°C; (760 mm); VP, <0.01 mm Hg at 20°C; Fr P, sets to glass below —90°C; Visc, 4.9 cps at 20°C; sol in water, <0.01% at 20°C; sol water in, 0.4% at 20°C; completely soluble in acetone, benzene ethyl ether, heptane, methanol, and carbon tetrachloride; odor, mild, ammoniacal; color, water white. Chemical properties: undergoes usual reactions of secondary amines. Suggested uses: extractant for acidic materials; acid acceptor; alkaline organic solvents; intermediate for pharmaceuticals, rubber chemicals, and corrosion inhibitors. Availability: development quantities.

N,N-DI-(alpha-METHYLBENZYL) ETHYLENE DIAMINE
(Carbide and Carbon)



MW, 268.39; Sp G, 0.9995 at 20°/20°C; BP, 205°C (10 mm); Fr P, —22°C; sol in water, <0.01% at 20°C; sol of water in, 4.2% at 20°C; pale yellow, mobile liquid. Development work over the past year has shown this compound to be useful for the preparation of permanent, nonyellowing, gas fading inhibitors. These inhibitors are generally applied to the goods from water dispersions. It is also suggested for the synthesis of sequestering agents, corrosion inhibitors, and demulsifiers. Availability: commercial quantities.

EUVON ASN
(Nova)
A wetting agent, protective colloid and solvent for Naphthol AS dyeings. It is a dark brown liquid readily soluble in water, of weakly alkaline reaction. It is stated that it will prevent the precipitation of calcium or magnesium compounds in coarse form or their deposit on textiles. It is further stated that, on account of its protective colloidal properties, Euvon ASN will prevent any flocculation of naphthol formed by hydrolysis.

FABRICON
(Burkart-Schier)
Nonstaining, nonsubstantive softening and finishing agent for cellulose or mixed fabrics. Modified fatty ester base. Easily emulsified . . . emulsions have good stability.

FANCOSEAL
(Fancourt)
An emulsion containing lanolin in conjunction with vegetable waxes recommended for softening and lubricating nylon hosiery. This product is compatible with other conventional hosiery finishes and it is reported that excellent boarding properties are obtained by its use.

FANCOSOL
(Fancourt)
An effective nonfoaming polyethoxy alkyl nonionic penetrant, wetting agent and detergent. Fancosol is recommended particularly, where foam is a problem, as a penetrant and dyeing assistant for package dyeing, vats or skein dyeing to give greater uniformity of shade.

FEL
(Fancourt)
A concentrated lanolin emulsion dispersible in water and compatible with all conventional hosiery finishes. By the use of FEL, it is claimed various amounts of lanolin may be exhausted on nylon hose to produce a soft plyable hand or it may be altered as desired to various degrees of firmness, body or fullness. FEL, it is claimed, aids the exhaustion of hosiery finishes and when used with delustering agents uniform even dulling can be obtained along with sheerness.

FELCOBASE SAL
(Feeley)
An emulsifier developed specifically for use in conjunction with methyl salicylate to render it more dispersible in the dyebath. It is stated that Felcobase SAL added to methyl salicylate in suitable proportions will give a particle size emulsion to satisfy each individual need.

FELCOFIX
(Feeley)
This is claimed to be a very efficient after-treatment for directs, develops, sulfurs, etc. to improve fastness to washing. Certain colors may be improved to pass #3 wash test. The product is mildly cationic and has little effect on shade and fastness in most cases. Normally used without copper but can be used with copper or formaldehyde where these agents are helpful.

FELCOFIX CM
(Feeley)
This is a temporary color fixing agent for use on directs, develops, etc. Usually applied in last rinse bath to reduce or prevent bleeding of colors during wet handling, while waiting for drying or subsequent processing. Wash fastness improved through several washings in many cases.

FELCOLUBE 121
(Feeley)
Said to be a highly efficient softener for piece goods and package machine work. Gives high lubrication and efficient knitting characteristics. Blend of anionic softeners and mineral oil types which disperses easily and completely in hot or cold water and does not separate in the bath on long standing.

FELCOLUBE 146
(Feeley)
A high lubricity softener combining characteristics of sulfonated fatty types and anionic ester types. Said to maintain perfect dispersion in the bath with no separation or scum formation. Suitable for piece goods and package application on yarn. Good knitting efficiency.

FELCOLUBE K
(Feeley)
Newly developed fatty ester type napping lubricant especially for woolens. It is stated that fewer passes are needed to yield a smooth, even and clean nap. Does not wash off readily and retains a desirable "hand" through to the finished piece, reducing or eliminating further finishes. Claimed to have excellent resistance to yellowing from heat and storage.

FELCOTEX
(Feeley)
Claimed to be a very efficient conditioner and hygroscopic agent for application to yarns and pieces to improve hand and moisture regain properties. Has no effect on shade or fastness. In some cases an improvement of wet fastness properties of some colors is found. Felcotex is highly compatible with other types of finishing agents.

FELSYN 61
(Feeley)
Water dispersible dyeing assistant of the phenolic type for use in Dacron dyeing. Felsyn 61 is said to offer advantages over para-phenyl phenol in that it is not necessary to predissolve with caustic soda or to acidify between the pretreatment and the dyeing. May be diluted with water and added directly to the dyebath. Leaves the goods with a good soft hand.

FILASEAL SOFTENER LSX
(Amalgamated)
An amide compound containing lanolin for use as a softener on various films and blends thereof. A high degree of lubricity and softness is said to be obtained on hosiery, piece goods and tricot. Easy to apply, it may be used alone or in conjunction with other finishes.

FIRE RETARDANT 527-C
(Laurel)
A nonpermanent fire retardant which is said to show excellent flame resistant and afterglow preventative properties. It does not effluoresce in the goods. Is supplied in liquid form for easy handling.

FLAME RETARDANT BASE
(Nova)
For fireproofing textiles. At high temperatures, it develops gases, which are said to prevent treated material from coming into contact with air in case of fire. Such textiles are not incombustible, but can be made to flame only with difficulty.

FOAMICIDE 581
(Colloids)
A new defoamer said to be of unusual value in glues, starch, latex or resin formulations. Data sheet available.

GEON LATEX 450 x 167
(Goodrich)
This new addition to the "Geon" latex line is a polyvinyl chloride based latex which upon room temperature drying, forms tough, heat and light stable films, fiber to fiber bonds, and pigment to fiber bonds. It is said to offer many advantages for functional and decorative coatings, fiber and fabric sizes, and binders for nonwoven fabrics. Geon latex 450 x 167 takes a high degree of loading without serious sacrifice in physical properties. Unloaded films and coatings are said to have excellent transparency and gloss.

GERMOCID
(Nova)
A preservative and disinfectant with wetting and re-wetting properties. It is easily soluble in water, giving a clear solution. The product is said to be stable to a great extent against acids, alkalies, hard water and metal salts. It has a faint, not unpleasant odor. Aqueous solutions of the product foam. It is said to be strongly surface active and the surface tension of water is quickly reduced. Although its wetting out action is substantial, its speed of wetting out vegetable and animal fibers is low, which is to be attributed to the fact that the product is absorbed to a great extent by the textile material. It is stated that textile material which has been treated with Germocid displays, after drying, outstinding absorbency and "re-wettability". It acts as a disinfectant and preservative against certain bacteria as well as fungoid growths (mildew).

GFN INHIBITOR BASE
(Nova)
Claimed to be an efficient dyeing and finishing compound to prevent fading of gas sensitive acetate dyeings. Dissolves completely in the dyeing bath and is said to have no effect on the brightness of the dyed shade.

GLUTARARALDEHYDE
(25% Aqueous Solution)
(Carbide and Carbon)
$OHCCH_2CH_2CH_2CHO$. MW, 100.11; Properties of 25% sol: Sp G, 1.066 at 20°/20°C; BP, 101°C (760 mm); VP, 17 mm Hg at 20°C; Fr P, —5.8°C; sol in water, complete at 20°C; odor, mild; color, water white. Chemical properties: the two aldehyde groups react through cross-linking to insolubilize polyhydroxy compounds and proteins. Suggested uses: insolubilization of polyhydroxy compounds and proteins to give products useful as binders for cork, gaskets, and matchers; coatings for textiles and paper. Of particular interest for imparting water resistance to polyvinyl acetate latex emulsions and polyvinyl films; and for imparting shrink and crease resistance to textiles. Availability: development quantities.

GLYCINAL HD2
(Nova)
A solvent and fixing agent for use in vat color printing of textiles. It is a yellow hydroscopic liquid with a neutral reaction, soluble in water. It is stated that, under unfavorable aging conditions, an addition of Glycinal HD2 insures an adequate fixation of the vat colors.

GTO #5
(Fritzsche)
A very powerful, effective and economical industrial odorant for masking unpleasant textile processing odors.

HARTO-RESIN PCS
(Hart)
A 55% polyvinyl acetate emulsion which is said to impart to textile fabrics a durable full hand without excessive stiffness.

HARTUWET S
(Hart)
A water-dilutable emulsion containing 30% silicone solids. It is said to impart to textiles a finish which is durably water-repellent to dry cleaning and laundering, stain resistant, and to show improved sewability plus increased tear and abrasion resistance. It is stated that fabrics do not retain chlorine during laundering. Resins imparting crease resistance and shrinkage control are often used with Hartuwet S.

HOMOGESOL LTE
(Woonsocket)
A stable thin liquid syrup resin to impart stiffness and shrinkage control to cotton and rayon. May be used with paste-type resins to control hand.

HOMOGESOL LTS
(Woonsocket)
An ether modified viscous liquid urea-formaldehyde resin used to impart body and stiffness to rayons. May be used alone, or in conjunction with paste type resins to modify hand.

HYDROCOP
(Laurel)
Well known as a winder trough emulsion for conditioning cotton, wool, and rayon knitting and weaving yarns, Hydrocop has now found wide acceptance for conditioning both cotton and rayon chenille yarns. Its use is said to eliminate the necessity of long periods in the conditioning room. It is suggested that Mildant RX be used as a mildew inhibitor. When used with 3B Softener, Hydrocop also improves the knitting properties of Orlon yarns.

HYGROLIZED OIL 221
(Colloids)
Unique wool top oil said to offer positive static elimination, reduced fly, superior lubrication. Applied neat or from emulsion, Hygrolized Oil 221 is said to meet the specifications of the Wool Associates of the New York Cotton Exchange. May be fortified with Hyrgola 64 or Delectrol 379 for extreme static or conditioning problems.

IGEPON* TE-42
(General Aniline)
Igepon TE-42 is an anionic surfactant said to possess good foaming, wetting, emulsifying, detergent and dispersing properties. This product, which is in the form of a white, viscous liquid, is used in cotton and wool wet processing and is particularly effective for washing all cellulosic fibers. Igepon TE-42 is said to be the first commercially available synthetic detergent based on tallow fatty acid. It is stated that it is ideal for all detergent problems where high efficiency at low cost is required. It is further stated that this "heavy duty" Igepon gives detergency comparable to that of a high titer soap and possesses the advantages of outstanding stability to acid, alkali, and hard water and is unaffected by bleaching and reducing agents.

* Registered Trade-mark

IMPREGNOLE* SP
(Warwick)
As a recent addition to the well established Impregnole products water repellent finishes, Impregnole SP is said to combine in a single package many desirable finishing characteristics beside being a nondurable type water repellent. It is stated that it possesses fabric building qualities, produces spot proof finishes, likewise produces anticrocking effects on many types of fabric, as well as water repellency. It is also versatile enough to be used partly as a lubricant thus imparting abrasion resistance to many types of fabric.

* Registered Trade-mark

INFEROL H-138
(Pioneer)
A combination of a wetting and rewetting agent with a defoamer. Recommended by the manufacturers whenever a maximum of penetration with a minimum of foam is desired.

INHIBITEX
(Tex-Chem)
A durable type of atmospheric gas fading inhibitor. Inhibitex is applied directly in the dyebath during the dyeing of acetates. It is stated that it results in durable protection against atmospheric gas fading without causing yellowing. Inhibitex is said to form an excellent dispersion in water, and will therefore not result in any of the difficulties encountered with poorly dispersed products.

"INSONITE"* DYE FIXING AGENT
(DuPont)
"Insonite"* Dye Fixing Agent has been especially prepared to improve the washfastness and nonstaining properties of direct dyes on both cotton and rayon. These advantages are obtainable when the product is applied with or without crease-resisting resins. "Insonite"* is further recommended for improving the waterbleeding fastness of acid and direct dyes applied to paper. "Insonite"* is a clear, amber-colored solution stable to normal storage conditions. Freezing should be avoided. It is slightly acidic in nature, although it is neutral at application concentrations and cationic in reaction.

* Registered Trade-mark

KALEX CUL
(Hart)
A sequestering agent of the polyamino carboxylic acid type used as a chelating agent for calcium, magnesium, zinc, copper, and ferrous and ferric iron. It is said to differ from the ethylene diamine tetra acetic acid sequestrants in its high copper, zinc, and ferric iron sequestering powers.

KALEX G
(Hart)
A sequestering agent of the polyamino carboxylic acid type used as a chelating agent especially for copper and ferric iron. It is claimed to show 25 times the ferric iron sequestering power and 5 times the copper sequestering power of the ethylene diamine tetra acetic acid type.

KALEX V
(Hart)
A sequestering agent of the polyamino carboxylic acid type used as a chelating agent for hard water salts, ferrous iron and other metal ions. It is soluble on the acid side.

"KETOSOL"* SOLVENT 75
(Carbide and Carbon)
A mixture of 3 parts phenyl methyl carbinol and 1 part acetophenone. Sp G 1.018 at 20°/20°C; BP, 202.4°C (760 mm); Fr P, 7.7°C; sol in water, 2.4% at 20°C; sol water in, 5.7% at 20°C; Fl P, 205°F (open cup tester). During the past year "Ketosol" solvent 75 has been used as an effective dye carrier for Dacron polyester fibers. Concentrations of 10 to 15 grams per liter of dye bath promote uniform dyeing. At these concentrations "Ketosol" solvent 75 is soluble in water and can be added directly to the dye bath. No emulsification is necessary. It is stated that "Ketosol" solvent 75 does not affect the light stability of acetate dyes and it can be easily removed from the fabric by a water rinse. It is suggested for dyeing blends of Dacron and viscose and Dacron and wool as well as 100 per cent Dacron fabrics. Availability: commercial quantities.

* Trade-mark

KYRO* EO
(Procter and Gamble)
A 100% active nonionic of the alkyl phenol polyethylene oxide condensate type. It is widely used as a detergent, wetting and rewetting agent, and dye assistant on all types of fibers. It can be safely used with acids, alkalies, salts, oxidizing agents, reducing agents, resins, water repellents and softening or finishing agents (anionic, cationic and nonionic)). It is stated that it is extremely resistant to hard water and has high dispersive action on any lime soaps which might be in the bath, thereby doing much to prevent their redepositing.

* Registered Trade-mark

LANAZINE TIP
(Organic)
A product composed of fatty esters for the express purpose of giving more level dyeing on tippy wool. Lanazine Tip is intended for use particularly in the dyeing of loose wool, but it is stated that its good penetrating and leveling properties extend its usefulness to the dyeing of yarn, tops and piece goods. The product gives equally good results with both acid and chrome colors.

LANOSEAL
(Fancourt)
An aqueous emulsion containing lanolin for imparting softness, lubrication and body to nylon hose. Lanoseal aids in the exhaustion and leveling of delustering agents to produce even uniform dulling. In conjunction with other conventional hosiery finishes, it is claimed the proportions of Lanoseal may be varied to produce extreme body and fullness or soft sheer hose which board and pair easily.

LAURAMINE #20
(Laurel)
An improved anionic paste softener for cotton yarns and piece goods. It is stated that it will impart softness and lubricity; is very stable and highly resistant to yellowing. This product may be used as a softener and plasticizer in sizing and backfilling formulations. On piece goods it will lubricate the fibers so as to facilitate cutting and sewing, and impart a full, resilient hand.

LAURAMINE #20A
(Laurel)
An improved anionic softner similar to Lauramine #20, except that it is in liquid form. It is easily dispersed and convenient to use. It is recommended for use on cotton yarns, and blends.

LAURELTEX YM
(Laurel)
A wetting and rewetting agent of high activity. May be used whenever an efficient wetter or rewetter is required. It is said to be stable to mild alkaline and acidic baths. It shows best results on cotton yarns and fabrics.

LEMAC POLYVINYL ACETATE BEADS
(American Monomer)
Lemac polyvinyl acetate beads are available in six grades of increasing viscosity, listed as Lemac 7, 15, 40, 150, 1,000, and 6,000. These are thermoplastic, colorless, nontoxic granular powders suitable for adhesive formulations, inks and paper coatings.

LEMAC WD
(American Monomer)
Lemac WD is a vinyl acetate copolymer soluble in alkaline solution. Applications include preparation of textile finishes, textile sizes, adhesives, paints and paper coatings.

LEMOL 65-98 POLYVINYL ALCOHOL
(American Monomer)
Lemol 65-98 is a new high viscosity, completely polymerized polyvinyl alcohol resin said to offer special economies for adhesive and textile use.

LIPAL 4P
(Drew)
A nonionic gel preventative for use in sizing. The application of less than 1% Lipal 4P in aqueous starch paste inhibits the gelation of the starch and produces a viscous suspension which measurably increases the flow characteristics of the starch paste.

LUBRITONE S
(Tanner)
A very economical softener specifically designed for napping. It is a mixture of fatty acids and emulsified hydrocarbons properly balanced for optimum lubrication. It gives the cloth a scroupy hand and is said to provide excellent lubrication reducing the number of passes required to obtain a full nap. It has excellent resistance to yellowing and rancidity.

LUMATTIN SL
(Nova)
A substantive delustering agent for rayon and staple fiber. It is a white paste, easily dilutible with the quadruple quantity of warm water to a milky-white, finely dispersed suspension. The suspension is indifferent to salts causing hard-

ness of water and can therefore be diluted with hard water in every proportion. Plant water with alkaline reaction must be neutralized before adding Lumattin SL. It has a good affinity, which can be still further improved by slowly heating the dyebath up to approximately 350°C and by adding acetic acid. The delusterings produced with Lumattin SL are said to be fast to rinsing, do not dust and give rayon and staple fiber a full, soft feel. It is not compatible with all normally applied anion active detergents, softeners, wetting and levelling agents; these products must therefore be removed by thorough rinsing if they are on the materials to be delustered.

LUNETZOL A
(Nova)

A nonfrothing wetting and leveling agent. It is a clear, yellowish brown, slightly viscous liquid of practically neutral reaction. It is readily and rapidly dispersed in water, yielding slightly opalescent solutions. It is claimed to be an excellent leveling agent for direct sulfur and vat dyestuffs. A special characteristic of Lunetzol A is said to be its exceptionally low lathering power, so that this product may be applied without any danger of the goods floating.

LYOFIX® EW CONC
(Ciba)

It is stated that this is a new highly effective product for improving the fastness to water, perspiration, damp hot pressing, washing, sea water, sizing, fulling and finishing of direct, diazo, sulfur, and union dyeings, and of prints produced with direct and acid dyestuffs on cotton, linen, spun and filament viscose, silk and mixed materials containing wool.

® Registered Trade-name

MACCO FINISH 6000
(Mac)

This unusual paste form product combines weight and finish in one operation, especially on tubular knit goods, where it is best applied on the Tube-Tex machine. It is stated that as much regain as 8 ounces to the dozen on knitted fabric can be obtained with natural elasticity and softness retained, at a very low cost.

MELOTEX CT
(Woonsocket)

A new nonionic softener, especially prepared for use on white cottons and rayons. It is said to give good softness and body, does not discolor on Sanforizing, and will not turn rancid on storage. It is easily dispersed in warm water, and is compatible with resins, starches and other finishing agents.

MELOTEX R
(Woonsocket)

A nonionic softener especially for use on dyed rayon or cotton. It is said to provide good softness and body with a minimum of effect on light fastness of direct colors. Compatible with starches, gums, resins and most finishing agents. Easily dispersed in warm water.

METAGEL-811, 811-32, 820, 860
(Eastern)

A series of copolymered resins especially adapted to the printing of metallics as well as for the adhesion of pigments and oxides to textiles. The numerals attached designate various viscosities. The Metagels are water-phased, quick drying and require no curing. Samples on request.

METHACROLEIN DIMER
(2-5-Dimethyl-2-Formyl-2,3-Dihydro-1,4-Pyran)
(Carbide and Carbon)

$C_8H_{12}O_2$.MW, 140.18; Sp G, 0.996 at 20°/20°C; RI, 1.4531 at 20°C; color, water white. Chemical properties: Hydrolyzes to form 2,5-dimethyl-hydroxyadipaldehyde; reacts with hydrogen to form 2,5-dimethyl tetrahydropyran-2-methanol; the double bond reacts with alcohols and phenols to form the corresponding alkoxy and phenoxy substituted dimethyl formyl tetrahydropyrans; the aldehyde group reacts with ammonia, amines, and alcohols, and can be oxidized to the corresponding acid. Suggested uses: As an intermediate for textile specialties. Availability: development quantities.

MILDANT RX
(Laurel)

Said to be a highly effective mildew preventive to be used in conjunction with winder trough emulsions for treatment of cotton weaving, knitting and chenille yarns. It is said to be very good for use in wet twister troughs.

MONALUBE CT
(Mona®)

A lubricant for cotton sewing thread to be applied in winder troughs.

MONASOFT CTH
(Mona®)

A cationic softener for rayons and cottons, can be supplied in 25, 50 or 100% concentration.

MONATERGE CD
(Mona®)

A compound detergent for jig work, specially suited for rayon and acetate fabrics.

NAMISYN 200
(National Milling)

This liquid nonionic surface active agent is a polyoxyethylene ester alcohol. A neutral concentrate, it is said to be especially effective for kier boiling, dye leveling, raw wool scouring, and as a carbonizing assistant. It is claimed to have superior detergency and penetration ability in hot alkaline solutions and to be stable to acids and alkalies. In general, it is said to be an excellent dyebath assistant on all fibers.

NATIONAL NACCONOL SL
(National)

An anionic synthetic organic detergent of the alkylarylsodiumsulfonate type in liquid form and is the newest addition to the well-known Nacconol series. Neutral in reaction and exhibiting high stability to acids, alkalis, water hardness, and oxidizing and reducing agents, the manufacturer reports that it is also an excellent wetting, foaming, emulsifying, dispersing, and penetrating agent which effectively reduces the surface tension of water solutions. National Nacconol SL may be readily diluted with water in any proportion to provide convenient working concentrations. One of the prominent physical features of National Nacconal SL is its ability to remain clear and free flowing down to 32°F or below. This eliminates the need for applying heat to stock solutions or for storing the material in heated locations unless the temperature is likely to be lower than the freezing point of water. There is no actual freezing point for National Nacconol SL. However at low temperatures it will set up to a thick viscous form but may be restored to its normal condition when permitted to warm up to room temperature.

NEKAL* WS-21 AND NEKAL* WS-25
(General Aniline)

The Nekal WS brands are high speed, low foaming wetting and rewetting agents. These liquid anionic surfactants are said to be outstanding in performance in both hot and cold liquors; they are stable in hard and soft water. As wetting agents, the Nekal WS products can be used in such applications as padding and long liquor dyeing, sizing and desizing, bleaching, raw stock processing, package and beam dyeing, and finishing. As rewetting agents, they can be applied in the treatment of fibers prior to dyeing and printing, in the Sanforizing operation, and in finishing operations. Nekal WS-21, and the triple strength Nekal WS-25, are sulfonated aliphatic polyesters. They are soluble in water in all proportions.

* Registered Trade-mark

NEKANIL AC SPECIAL
(Nova)

A cleansing and dispersing agent particularly suitable for acetate dyeing. It is a light brown clear liquid of slightly alkaline reaction. Soluble in water in any proportion. It is said to be stable in hard water, with acids and alkalis, and also to metal salts. It is stated that it is particularly efficient in removing impurities during the soaping operation.

NEKANIL C CONC
(Nova)

A versatile nonionic auxiliary product. It is a slightly viscous, clear liquid of neutral reaction. It is soluble in water and stable to metal salts. It has wetting and re-wetting properties. Nekanil C Conc is claimed to be an excellent dyeing assistant and an efficient cleansing agent.

NEKANIL LS
(Nova)

A washing and dyeing auxiliary. It is a brown, oily liquid with low salt content, easily and clearly soluble in water. It is well stable against acids, alkalis, hard water and metal salts. It is claimed that, because of its wetting-out, frothing and washing as well as its excellent dispersing and protective colloidal action, Nekanil LS is a versatile washing and dyeing auxiliary.

NEKANIL O SOLUTION
(Nova)

A detergent for neutral and acidic washing of wool. It is a yellowish liquid of low viscosity and with a practically neutral reaction, miscible with water in all proportions. This product is said to be inert to acids, alkalis, hard water and salts of heavy metals, provided these are not present in such high concentrations as to cause salting out. At temperatures above 195°F (90°C) the aqueous solutions become turbid, but they become clear again when the temperature falls below this turbidity point. This typical characteristic of the product is due to the fact that the solubility of Nekanil O Solution in water, contrary to that of anionactive substances, decreases with rising temperature. It is said to have an outstanding dispersing action on pigments of all kinds and especially on calcium salts, magnesium salts and heavy metal salts of soaps and of other textile auxiliaries and also of dyestuffs. It is claimed that, unlike soap and other anion-active auxiliaries such as alcohol sulfonates, it is capable of dispersing fatty substances and mineral oils and of keeping them in solution, even in an acid medium. The use of this product was said to be the first satisfactory solutions of the problem of acidic wool washing. In hot baths Nekanil O Solution has a pronounced wetting-out property.

NEKANIL S
(Nova)

A penetrating and leveling agent with affinity for fibers for dyeing wool, felt and hats. It is a light colored brownish yellow powder easily soluble in water. The aqueous solutions are clear and have a practically neutral reaction. This product is said to be stable to a great extent against acids, alkalis, and hard water. It is claimed that, besides remarkable dispersing power, Nekanil S has excellent penetrating and levelling action on acid and chrome dyestuffs when these are used for dyeing animal fibers. The use of Nekanil S has no or only very slight influence on the shade.

NEKANIL SBS PASTE HIGH CONC
(Nova)

A wetting-out agent for carbonizing. It is a dark brown, fairly viscous liquid which dissolves easily in water with an acidic reaction to Congo. It is claimed that the aqueous solutions have a pronounced wetting-out power and are remarkably stable against acids. This product, therefore, can be added to the sulfuric acid used in carbonizing in order to enable the acid evenly to penetrate the wool and its vegetable contaminations, thus fulfilling the condition for complete destruction of the latter in the subsequent carbonizing process. In addition, it is possible to reduce the concentration of the carbonizing acid.

NEKANIL W EXTRA
(Nova)

A detergent for wool in all stages of processing. It is a yellow-brown, oily liquid at temperatures above 15°C (59°F), which congeals to a semi-solid paste or 8°C (46°F) and becomes solid at 5°C (41°F). When warmed, the solidified product returns to its normal consistency. It is soluble in water in any proportion, the solutions obtained thereby showing a slightly alkaline reaction to litmus.

NEOPON
(Royce)

A modern detergent in gel form. Its reaction is neutral and can be adjusted to any desired pH. It is stated that it is odorless, almost colorless, easily soluble in hot or cold water, and stable to acids, alkalies and hard water. It is said to be next to soap in detergent power, to have good wetting power, moderate foaming properties and can be used as a dispersing agent for direct, acetate and vat colors. It is used extensively for after-soaping dyed colors, naphthol, vat and sulfur colors.

NEOQUEST
(Royce)

Ethylene diamine tetra-acetic acid, sodium salt. It is said to be an effective chelating or sequestering agent. Used with soap in hard water, it is said to prevent precipitation of lime soaps; used in vat dyeing, it is said to inhibit the destruction of the dyestuff by any metallic salts present in the water, giving fuller and brighter shades.

NEO SIZE
(Tex-Chem)

A complete size for synthetic filament yarns. It is said to have excellent flexibility and film forming characteristics and to be very easy to handle since it is readily soluble in water.

NEOWHITE D LIQUID
(Fiber Chemical)

A new liquid whitener and brightener. It is said to be stable, powerful and freely soluble and may be used successfully in liquid soaps, detergents, and starches. It is easy to handle and may be measured by volume or directly

metered if used in machine dyeing or with continuous processes.

"NIATEX"* ANTI-STATIC AG-1
(Carbide and Carbon)

A durable anti-static finish for use on synthetic fibers such as nylon, Dacron, Orlon, Acrilan and acetate. Product is supplied as a colorless, 40% aqueous solution. "Niatex" AG-1 can be applied by padding and fixed on the fabric by heat treatment. The finish is said to impart an excellent hand to the fabric and is not removed by washing or dry cleaning. Availability: semi-commercial quantities.

* Trade-mark

NOPCO 1572-R
(Nopco)

A new polyvinyl acetate emulsion which has uses in many industries including textile. It is stated that it is colorless, odorless, nontoxic, and is one of the cheapest synthetic resin emulsions available.

NOPCOTEX B
(Nopco)

A new, improved yarn and fabric softener. This product, which replaces Nopco 2225-V, is applicable to both natural and synthetic yarns and fibers. It dissolves more readily than the older product in water and it is also said to exhibit outstanding lubricating qualities for use in napping woolen fabrics. It is stated that it is a 100% active product, unique because of its nonyellowing and static protection features. This product is in the form of flakes but it is also available in paste form under the name of Nopcotex B Paste.

NORANE* S
(Warwick)

Norane S, the latest addition to Warwick's impressive array of water repellent agents, is basically a silicone emulsion. Norane S is applied in conjunction with Warwick's Catalyst SC-3. It produces a durable water repellent finish, said to possess excellent resistance to dry cleaning. Designed to be used with regular finishing resins Norane S imparts a soft full hand to the resin finish. Norane S not only produces stain resistant finishes but imparts some degree of abrasion resistance to many styles of mixed fibers. It may be used on nylon tricot, on heavy multifiber gabardine suitings or novelty embossing operations.

* Registered Trade-mark

NOVAFIX CA
(Nova)

A fixing agent for aftertreatment of direct dyestuff. It is said to show noticeable improvement in fastness properties of this group of dyestuffs.

NOVAFIX CU
(Nova)

A resinous copper complex salt which is said to improve fastness properties of direct dyestuffs in dyeing or printing. It is recommended by the manufacturers for aftertreatment of textiles.

NOVAFIX WW
(Nova)

This product representing amino condensates is used in aftertreatment of direct colors to obtain a good fastness to washing.

NOVAMOL WS POWDER
(Nova)

An acid-stable protective colloid and dyeing auxiliary. It is a brownish, somewhat hygroscopic powder which may be readily dissolved in water of any degree of hardness. The product is to a great extent stable against alkalis, acids and salts. It is not surface active, and therefore does not show any wetting-out, lathering, or scouring effect, but its protective colloid action is said to be excellent. It has a certain affinity for animal fibers (wool, silk, etc), as well as for nylon.

NOVANOL AO POWDER
(Nova)

For softening water and removing insoluble metal compounds from textiles. It is an almost white, slightly hygroscopic powder. It is clearly soluble in warm and cold water. The aqueous solutions have an alkaline reaction, but not stronger than that of soda solutions. It is said to be stable against boiling and alkalis.

NOVANOL B POWDER
(Nova)

For softening water and removing insoluble metallic compounds from textiles. It is an almost white, slightly hygroscopic powder which dissolves clearly in warm and cold water. The aqueous solutions show an alkaline reaction but not stronger than a soda solution. It is said to be stable against boiling and alkalis and its efficiency to be independent of the temperature. It reacts with calcium and magnesium compounds and a number of compounds of other metals such as iron, lead, copper, manganese, etc, forming water-soluble complex compounds. Water that has been softened with it, therefore, will not produce difficult soluble complexes or precipitations when soap or soda is added.

NOVANOL NAP
(Nova)

A dyeing assistant primarily recommended by the manufacturers for aftertreatment of naphthol dyeings to improve fastness to crocking. It is in powder form, readily wetted out and dissolved in water. It is stable to hard water, acid and alkalis.

NOVANOL R
(Nova)

A versatile detergent based on a fatty alcohol sulfonic acid condensation product.

NOVAPON A
A detergent based on a condensation product of protein derivatives with fatty acids. It is said to be an excellent wetting and emulsifying agent, as well as a dyeing assistant.

NOVAPON NE
(Nova)

A printing and dyeing assistant for wool. It is said to improve the appearance of woolen material, increase penetration and promote level dyeing. It is said to have an affinity for dyestuffs and therefore is an efficient stripping agent.

NOVATOL
(Nova)

An aromatic nitro compound, representing a mild oxidizing agent. Primarily used to prevent "facing" of goods in discharge printing. It is in powder form and readily soluble in water.

NOVULPHOR A OIL-SOLUBLE
(Nova)

An emulsifier for mineral and fatty oils. It is a fluid, brown oil of neutral reaction, considerably stable against hard water. It is easily soluble in most technical fatty and mineral oils and emulsifiable in water.

NOVULPHOR EL
(Nova)

A versatile emulsifier. It is a yellowish-brown oil which becomes pasty at low temperatures. It is readily soluble in water, liquid or melted fatty acids, mixtures of these with mineral oils, paraffin waxes and fats, waxes and a variety of organic solvents. It and its solutions give a neutral reaction. It is said to have excellent stability against hard water. This product is saponified by strong alkalis, but it is compatible with weak alkalis and acids, particularly at low temperatures.

NYLONSCOUR MS
(Mona®)

A solvent-carrying detergent for the Burlington machine.

OLAMINE WN
(Laurel)

A versatile, easy to use cationic softener which is said to show excellent softening properties and resistance to aging. It is stated that it produces excellent results on both natural and synthetic fibers, is compatible with common resin finishing compounds, and shows excellent results as a fixing agent for direct colors.

ORCO ANTIFOAM AF
(Organic)

A defoaming agent to be used wherever excessive foam is found to be troublesome. A stabilized emulsion type silicone complex, Orco Antifoam AF has found a wide range of textile applications, the minimum amount doing the job with ease.

ORCOBOIL #15
(Organic)

A product designed for the boiling off and pre-scouring of wool. It is claimed that, on actual mill runs, as much as 11%-16% in the grease has been removed from greasy wool. A sulfated alcohol and fatty condensate, it can also be used in the finishing of wool and as a general detergent. Its use is said to promote levelness in dyeing and to improve greatly the hand of the goods.

ORCOCEYLENE #30
(Organic)

A complex polyether condensate with a vegetable oil base, essentially neutral, salt free, nonionic detergent. It is stated that Orcoceylene #30 has been found to be extraordinarily effective in the soaping off of heavy vat prints, preventing completely the redeposition of color onto white or pastel designs or stripes on the fabric.

ORCOCHROMATE MORDANT
(Organic)

A mordant to be used in the metachrome process for dyeing worsted piece goods. Orcochromate Mordant is especially recommended by the manufacturers when dyeing for government contracts where consistency of results is a must.

ORCO FERROSOL POWDER WS AND ORCO FERROSOL LIQUID
(Organic)

A sequestering agent said to be of extremely high combining power with unwanted metal ions. A tetrasodium salt of ethylenediamine tetra acetic acid, Orco Ferrosol can be used directly in a dyebath to give brighter and more level shades on wool goods. The product can also be used as a general water softener, a printing assistant and has been found to be a great aid in the stripping bath.

ORCOPAL #18
(Organic)

A fatty acid tallow condensate formulated specifically for acid fulling of woolen goods. With Orcopal #18, woolen goods are carbonized in the grease, then fulled and neutralized in one operation using a fulling solution containing this product and enough alkali to neutralize the carbonizing acid plus a small additional amount to assist in the fulling and later scouring. It is claimed that this method produces better whites and brighter pastel shades, eliminates fulling mill wrinkles, decreases flocking and reduces residual grease and soap in the fabric as much as 70% compared to traditional procedures with other soaps.

ORCO SYNTHROWITE FWN
(Organic)

An optical bleach in a blended solvent for the whitening of nylon, acetate and wool from a bath where pH ranges from 7 on up. Due to its good exhaustion in the higher pH, its application to wool is optimum in the scouring bath.

ORCOWET #33
(Organic)

An extremely versatile wetting agent, to be used in a variety of operations in wet processing. Orcowet #33 is a sulfonated ester and is recommended by the manufacturers most highly in dyeing to promote penetration and levelness, as a dispersant for dyestuffs, and as an emulsifying agent.

ORCQUESOL LHN
(Organic)

A cresylic acid base detergent for use as a cold scour and an aid to soap where mineral oil and grease are present in the processing of woolen worsted piece goods and raw stock.

ORLENE
(Arkansas)

A dyeing assistant which was developed especially for use in dyeing Orlon staple in pressure machines. It not only assists the production of full, level shades, but also is said to prevent the fibers from matting during the processing. This latter factor maintains the natural fluffy condition of the fibers characteristic of Orlon. In addition to the properties mentioned above, Orlene is said to have excellent wetting properties which assist the penetration of the dye. As a general working formula, 2.% to 4.% of Orlene based on the weight of the fiber is recommended, adding it to the dye bath just previous to the start of the dyeing operation. In physical consistency, Orlene is a clear amber liquid which disperses readily in water of all temperatures to form a fine stable emulsion. The pH of working concentration is in the range of 9.8 to 10.0, but the bath may be adjusted to any pH down to 4. without loss of efficiency.

OROXALYDE LIQUID
(Organic)

A stripping agent for woolen piece goods and shoddy. Chemically a zinc formaldehyde sulfoxolate solution, Oroxalyde works best on the acid side and is especially recommended by the manufacturers for the Ogden Process of simultaneously stripping and dyeing in one bath. With this method not only is there an immense saving in time but, due to the reduced amount of handling of the goods, the results are claimed to be far superior to the usual two or more bath systems of stripping and redyeing. It is stated that the tensile strength remains very high, a soft hand is retained, and the salability is greatly increased.

PARAMUL* REPELLENT DC-1
PARAMUL REPELLENT DC-2
(Cyanamid-Resin)

This product is a two package, single bath

water repellent which is said to provide a water repellent finish with good durability to laundering and dry cleaning, especially on the hydrophobic, synthetic fabrics and blends thereof. Paramul Repellent DC-1 and DC-2 may be applied by padding or by the exhaustion methods followed by drying. It is stated that treated fabrics will have an excellent initial spray rating and good durability to dry cleaning. Treated synthetic hydrophobic fabrics also are said to have good washfastness. The hand of the finished fabric is usually soft and full and shows no mark-off.

* Trade-mark

PARAPERL HL (PATENTED)
(Progressive)
A nylon reserve which is said to be very effective for white and colored effects.

PENETRANT Y
(Fancourt)
A neutral dyeing assistant said to produce good unions on nylon hose. Penetrant Y is claimed to be an excellent dispersing agent for dyestuffs and its retarding and leveling action cause good color unions between nylon monofilament and multi-filament yarn.

PENETRON CONC
(Hart)
Claimed to be an exceptional wetting, rewetting and Sanforizing agent containing over 60% active ingredients. It is used for wetting of cotton before stock dyeing, as a dispersing agent for dyestuffs in order to give them color value, for plasticizing and leveling adhesives, and for wetting out in desizing rayon, cotton and acetate.

PENFORD FINISHING GUM 3XL AND 3XP
(Penick & Ford)
Penford Finishing Gum 3XL and 3XP are patented starch ethers that are said to have many film forming properties, such as greater clarity, greater strength and greater abrasion resistance, not found with conventional starches. These starch ethers have a hydroxl radical in a more reactive position and as a result, these products react with urea formaldehyde resins. It is claimed that this cross linkage with resins results in the formation of a durable starch-resin finish heretofore unavailable when using conventional starches. The only difference between the 3XL and 3XP Finishing Gum is in viscosity.

PERAPRET A
(Nova)
A binder for pigment and bronze printing; a finishing agent. It is a low-viscous, milky white dispersion of slightly ammoniacal reaction, and with a dry content of approximately 25%. This product may be diluted with water (up to 50 degrees English hardness) in any proportion. On drying, it yields a tough-elastic very slightly tacky, colorless film, which will swell but not dissolve in water. It is used as a binder for preparing pure white or pastel shade mat prints with pigments or pigment dyestuffs, said to be of good fastness to washing.

PERAPRET AX 45
(Nova)
A finishing agent for brushing and padding processes and a binder for printing with bronzes. It is a dispersion of low viscosity, with a dry content of about 40%, and gives a slightly alkaline reaction. This product can be diluted with water in any proportions. The stability against hard water of liquors prepared with Perapret AX 45 is adequate in the majority of cases. When dry, this product yields a flexible, slightly tacky film, which is insoluble in water. It is said to be suitable for the production of brushing and padding finishes, and as a binder for metallic powder prints. For brushing finishes and metallic powder prints, a thickener must also be used.

PERAPRET LN 25
(Nova)
A finishing agent for spreading and padding processes. It is supplied in the form of a white dispersion of low viscosity and approximately 40% solid content. This product reacts slightly alkaline and, on drying, yields a flexible film which is insoluble in water. Its stability against hard water is adequate for most purposes. The solutions are stable in hard water. It is suitable for the preparation of spreading finishes, especially for final coats. It can also be used for the preparation of pad finishes which are stable against repeated mild washings. It can also be applied together with other finishing agents.

PERAPRET PN
(Nova)
A finishing agent for nylon which is supplied in the form of a fluid dispersion of plastics, and can be diluted with cold or warm water in any proportion. Since its stability against hard water is limited it is advisable to use only soft water for this purpose. As a rule, this product should not be combined with cation-active softening agents, because this may impair the stability of the treating liquors. It is said to impart good firmness and firm stability to nylon hose in preboarding.

PERMALENE 134
(Refined)
A self-emulsifiable solvent-type detergent designed for the removal of heavy deposits of oil, grease and graphite from textile fibers, yarns and fabrics.

PERMALOID 155
(Colloids)
Unique vinyl acetate, plasticized co-polymer, alkali-soluble, said to offer properties of polyvinyl acetate in easy-to-use powder form. It is stated that it produces clear, tough, water- and grease-resistant films. Currently employed in textile sizing, finishing or where luster, hand, water-resistance are required. Data sheet available. Also, available as Permaloid 170, unplasticized counterpart.

PERMALOID 170
(Colloids)
Unique vinyl acetate co-polymer, alkali-soluble, said to offer properties of polyvinyl acetate in easy-to-use powder form. It is stated that it produces clear, tough, water- and grease-resistant films. Currently employed in textile sizing, finishing or where luster, hand, water-resistance are required. Data sheet available. Also available as Permaloid 155, a plasticized resin.

PERMA SET 660
(Refined)
A modified urea-formaldehyde type resin, developed to impart crease-resistance and shrinkage control to synthetic textile fabrics.

PERMA SET 700
(Refined)
A urea-formaldehyde resin of relatively high molecular weight. It is employed either alone or in combination with other resins to impart crisp surface finishes.

PERSOCO NS-500
(Berkshire Corp)
A complex scour said to possess excellent detergent properties on cotton and synthetic fibers. Recommended by the manufacturers for use on nylon, viscose, acetate, Dacron and Orlon as a detergent for removal of graphite, oil, grease and soil. It is claimed to be highly effective where graphite marks, oil stains and excessive soil are encountered in cotton fabrics.

META-PHENOLS 220
(Carbide and Carbon)
A light, color stable mixture of phenolic materials produced by coal hydrogenation. The most important characteristic of this mixture is the high proportion of meta-substituted compounds. Avg MW, 123; Sp G, 1.01 at 20°/20°C; Boiling Range, 213°C (1%) to 237°C (97%); sol in water, 0.2% at 20°C; sol water in, 6.8% at 20°C; Fl P; 235°F (open cup tester). It is useful for preparation of mercerizing penetrants, mildew-proofing agents, and phenolic resins. The unusual surface activity of penetrants made from this product is believed to be due to the presence of the ethyl phenols which comprise approximately 25 per cent of meta-phenols 220. Availability: commercial quantities.

PHORWITE K HIGH CONC
(Pharma)
A new optical white for application to cotton, viscose rayon and nylon. The product is easily applied by conventional methods.

PILATE FAST SALT O SOLUTION
(Nova)
An auxiliary for Pilate Fast Color dyeings. It is a yellow, clear liquid of low viscosity with practically neutral reaction. Miscible with water in any proportion. It is claimed that by applying Pilate Fast Salt O Solution it is possible to dye Pilate Fast dyestuffs which otherwise require 10% sulfuric acid, with only the usual amount of sulfuric acid necessary for levelling dyestuffs, without detriment to their excellent fastness properties. Several fastness properties, namely fastness to decatizing and perspiration and also fastness to rubbing of heavy shades, are said to be considerably improved by dyeing with this addition.

PLISSE GUM NO. 80
(Rumford)
This is claimed to be the only ready-to-use plisse gum on the market — gum and 50% caustic. Manufactured under rigid control it is said to give superior results due to uniform viscosity. Available in drums, tank trucks, and tank cars.

POLYCLYCOLAMINE H-163
(Carbide and Carbon)
$HOCH_2CH_2OCH_2CH_2OCH_2CH_2CH_2NH_2$. MW, 163.2; Sp G, 1.0556 at 20°/20°C; BP, 278°C; (760 mm); sol in water, complete at 25°C; completely miscible with acetone, benzene, carbon tetrachloride, and methanol at 25°C; odor, ethereal and slightly ammoniacal; color, water white. Chemical properties: primary amino alcohol containing ether linkages. Suggested uses: preparation of amides of fatty acids for use as organic builders for detergents; preparation of emulsifying agents and dispersants for pigments, dyes, and emulsion polymers; starting material for pharmaceutical syntheses. Availability: commercial quantities.

POLYCO 501
(American Polymer)
A 55% solids plasticized vinyl chloride emulsion said to have good flameproofing properties. Recommended as a flameproof coating on both woven and nonwoven fabrics.

POLYCO 563
(American Polymer)
A 40% solids stable aqueous dispersion of butadiene copolymerized with acrylonitrile. Polyco 563 is free of any monomeric plasticizer and is said to yield an inherently flexible, oil resistant film. Recommended for application on nonwoven fabrics.

POLYCO 580
(American Polymer)
A 25% solids polyacrylic acid solution which is manufactured especially for nylon warp sizing. Polyacrylic acid has been selected for its outstanding adhesion, ease of application and removal, toughness, flexibility and abrasion resistance. This product is said to offer the nylon weaver a size unexcelled for effectiveness and versatility.

POLYCO 612
(American Polymer)
A new 60% solids, fine particle type polyvinyl acetate emulsion for textile finishing. The high solids of this emulsion are said to enable the user to realize economies in handling and mixing.

POLYTAN #120
(Tanner)
A polyhydroxy ether compound which will condense with thermo-setting resins to form an insoluble product. It is used to add hand to crease-resistant, schreinered and glazed finishes. It reduces the resin required for finishes on synthetic fibers. On acetate fibers, it is an anti-slip finish when used with resins.

"PONTAMINE"* WHITE BT
(DuPont)
A water-soluble fluorescent whitening agent recommended for application to cotton and rayon in the form of yarns, knit goods and woven fabrics. It exhibits a strong greenish-blue fluorescence and is said to have very good fastness to washing, discharge and peroxide bleaching. The product can be applied at any temperature, although its greatest tinctorial effectiveness is in the temperature range of 130° to 200°F. It can be applied with the peroxide bleach to give better whites. It can be used equally as well in a rinsing operation after bleaching or in a finishing mangle; the product possesses very good affinity for both cotton and rayon when immersed for short periods of time in rinse baths. It is stated that "Pontamine"* White BT possesses good fastness to washing, retaining much of its original fluorescence when no additional whitening agent is present in the soap during washing. Dilute acids, practical steaming, hot calendering and ironing methods have little effect on the product; however, prolonged exposures (350°F and higher for several minutes) can seriously reduce its brilliancy. "Pontamine"* White BT can be directly incorporated with anionic softening agents to produce optimum bleaching effects during the finishing operation. The product is not compatible when mixed directly with cationic finishing agents and should be used with caution when added to finishing baths containing such agents.

* Registered Trade-mark

PRINTING GUM NO. 300
(Rumford)
A complete dry gum that requires the addition of no other gums. Producing a thickener having a low solids content which is said to give extremely high color values with both Rapidogen and vat colors. Suitable for kettle and votator cooking. Washes out very easily.

PRINTING GUM NO. 400
(Rumford)
A cold water soluble gum (100% solids) that can be combined with other thickners in one operation. It is said to improve color yield of any formulation.

PROFINE* PASTE
(Procter and Gamble)
Anionic stable chemical compound of fatty ester base in paste form which disperses readily with stirring in cool or lukewarm water. It is widely used on all types of fibers as a lubricant, finishing and softening agent. Profine Paste may be used alone or with urea, polyvinyl acetate, starch, dextrose, most gums, alkaline anti-fume finishes, resins, such as urea formaldehyde and many other finishing agents. Fabrics finished with Profine Paste are said to exhibit excellent sewability and are not as apt to be frayed and cut by the sewing machine needles. Profine Paste also shows excellent antistatic and moisture retaining properties.

* Registered Trade-mark

PRYM* FRN
(Warwick)
Requirements for the treatment of multifilament nylon marquisette or tricot in the production of a fire retardant finish are said to be met by Prym FRN resin complemented by Catalyst FR. An optimum concentration for production of a fire retardant finish must be used. The fire retardant gives a firm crisp finish when used at optimum concentration.

* Registered Trade-mark

PYROSET* FIRE RETARDANT SF EXTRA
(Cyanamid-Resin)
This product is a thermosetting resin developed to produce a fire retardant, stiff, resilient finish on nylon fabrics and particularly tulle, marquisette, and Rochelle nets. Pyroset Fire Retardant SF Extra produces a finish that is said to be durable to washing and drycleaning. The amount of Pyroset Fire Retardant SF Extra to be applied depends primarily on the type of fabric to be treated and the degree of stiffness desired. About 50% to 65% solids are usually applied to nylon Rochelle nets. The use of 2% Aerotex* Accelerator NF based on the resin solids will give maximum stiffness and fire retardancy. In instances where curing conditions tend to cause shade changes, especially on white nets, 3% of Aerotex Accelerator UTX on the resin solids is recommended. Pyroset Fire Retardant SF Extra is a water-white, clear, water-soluble syrup with good storage stability. It may be applied by using the normal procedure for resin treating nylon fabrics.

* Registered Trade-mark

"QUAKER REACTANT SC"
(Patent Applied For)
(Quaker)
An odorless cross-linking agent for imparting nonchlorine retentive shrinkage control to rayon fabrics. It is stated that it has been satisfactorily employed on rayon fabrics ranging from marquisette to heavy gabardines, as well as upon blends of rayon with acetate and blends of rayon with wool. Its use is said to result in better tear strength and better abrasion resistance than is the case with other dimensional control agents, as well as excellent whites.

RANEDARE C*
(Metro-Atlantic)
This material was developed primarily for use on cotton fabrics where highly durable, water-repellent effects are required. Finishes produced with Ranedare C are said to show outstanding resistance to laundering and dry cleaning. The product is a free-flowing emulsion, which is readily dispersible in water. Dilutions of Ranedare C are said to have excellent bath life and the product can be run continuously for long periods of time with no danger of scumming or build-up on the pad or bath separation.

* Registered Trade-mark

RANEDARE R*
(Metro-Atlantic)
It is stated that Ranedare R* is a highly durable water-repellent finish which is particularly effective when used in combination with thermosetting resins to produce combination water-repellent, crease-resistant, shrink-resistant finishes on rayon, and rayon acetate blends. It is further stated that Ranedare R* does not soften thermosetting resin finishes and in most cases does not change the hand of the finished fabric appreciably. The product is a water thin emulsion which can be easily dispersed in cold water. Ranedare R* is said to have excellent running properties and to be fully compatible with all of the materials normally used in resin formulations.

* Registered Trade-mark

RANEDARE SI*
(Metro-Atlantic)
A silicone base water-repellent emulsion, which is used in combination with Ranefix SI Catalyst to produce, it is claimed, highly durable, water-repellent effects on most textiles. Ranedare SI and the catalyst are both water thin emulsions which are readily dispersible in cold water. The product is compatible with all of the common thermosetting resins normally used in the textile industry. When used alone, Ranedare SI produces no unpleasant odors in fabrics and no afterwash is required. In addition to extremely durable water repellency, Renedare SI also is said to improve the sewability, hand, and tear strength of fabrics to which it is applied.

* Registered Trade-mark

RESEARCH SOFTENERS 20, 21, 22 AND RDA
(Dexter)
Four cationic softeners, which are claimed to be nonyellowing both during high-temperature treatment or on long storage of finished goods, Research Softeners 20, 21, 22 and RDA are said to differ only in pH and in the hand they produce. Recommended by the manufacturers for use with both natural and synthetic fibers, these agents exhibit high antistatic characteristics. They can be applied either in the final rinse after dyeing or by padding.

RESILOID 250
(Colloids)
Synthetic sizing agent said to offer most economical, highest weaving efficiency size for acetate, rayon, Fortisan, Orlon, and Bemberg yarns. Cloth quality is said to be superior. Additives, softeners, penetrants are not required. Simple hot water desizing. Data sheet available.

RESIN 107
(Jersey State)
A 55% polyvinyl acetate emulsion for fabric stiffening. Said to be ideal for cottons, nylons and ninons.

RESIN 300
(Jersey State)
A modified urea formaldehyde said to provide an extremely crisp finish of excellent dimensional stability. It is stated that it is ideal for crushproofing nylon, Dacron and Orlons.

RESIN SYRUP J S
(Jersey State)
A high solids urea-formaldehyde polymer for imparting a desirable firm hand to suitings.

RESIPON MF
(Arkansas)
An alkylated urea-formaldehyde resin precondensate which is used primarily as a finishing agent for hydrophobic fibers. When applied to such fibers it is said to impart body and weight to the fabric, and in high concentrations will produce an extremely stiff finish. As in the case of all thermo-setting resins, Resipon MF requires a suitable catalyst and curing at a high temperature. It is also useful in setting pigments, flame retardants, and other auxiliaries on fabrics. One of the oustanding uses of Resipon MF is in connection with the production of a stiff flame resistant finish on sheer nylon fabrics. In this connection, a special type of flame retardant, Fi-Retard SB, has been developed for use with this resin. It is stated that a combination of these two products when properly applied and cured, is durable to laundering and dry cleaning and, in this respect, passes the requirements of the Flammable Fabrics Act. The products are applied as a one bath process at high concentration and after preliminary drying, must be cured at 300°F for at least one to two minutes. It is stated that patch tests on human subjects have indicated that nylon fabrics treated with a combination of Resipon MF and Fi-Retard SB, do not cause skin irritation under normal conditions.

RESIPON NC
(Arkansas)
A modified urea-formaldehyde precondensate which is stable on storage for prolonged periods. It is used chiefly as a textile finishing agent to impart crush and shrink-resistant properties to cellulosic fabrics. In this connection, the extremely low chlorine retention of this resin is said to be one of its outstanding properties. It is also used to produce wash-resistant embossing and chintz effects. Like all thermosetting resins, it requires a suitable catalyst and a curing temperature in the range of 300°F. When used at moderate concentrations up to 10.%, it is said to impart a relatively soft hand as compared to the ordinary type of urea-formaldehyde resin. In cases where an extremely soft hand is required, softening agents may be used as additives without impairing the inherent properties of the resin itself.

REXAN O
(Dexter)
Level dyeing and penetration with direct, basic and vat dyestuffs is attributed to Rexan O, a nonionic agent, on all fibers except wool. This agent is said to exhibit good wetting powers in dyebaths and eliminates use of glue in vat dyeing and retards rate of exhaustion in the first few minutes without impairing total color yield on the fiber.

REXOBOND E-12
(Emkay)
A viscous emulsion of polyvinyl acetate used to produce a stiff hand said to be highly resistant to washing. It is compatible with softeners and starches and requires no curing.

REXOBOND E-24, E-36, E-48, E-60
(Emkay)
A series of modified polyvinyl resins adjusted from a very firm to a very soft hand. Recommended by the manufacturers as an anti-pilling finish for Dacron and Dacron and wool blends. Claimed to be highly resistant to abrasion and washing. Requires no curing.

REXODULL CNY
(Emkay)
A homogenized dispersion of pigments combined in a cationic resin carrier and binder. May be applied on padder or quetsch or exhausted from the dye beck. Produces a dull finish said to be resistant to washing and resistant to yellowing from heat and storage.

REXOSOLVE GA
(Emkay)
A mixture of liquid detergents and aliphatic solvents. Stable in acid solution. This product is recommended by the manufacturers as a solvent wash for cleaning oil and grease soils particularly when oxalic acid or ammonium bifluoride must be used in the same procedure or when acid must follow this treatment without rinsing.

RHOZYME MH
(Rohm & Haas)
A liquid diastatic enzyme said to possess excellent heat stability and desizing efficiency. It can be used in the solubilization of starch and the usual desizing method. The optimum results are obtained between pH 6 and 7.

RIBBON FINISHES:
Resin RF and Resin 112
(Jersey State)
High quality alkyd resins which are said to impart a crisp, film hand to acetate satins. RF and 112 are further said to provide excellent results without mark-off or decrease in original luster.

"SANOZIL" N
(Sandox)
Sanozil N is a modified anionic compound and is used as a wetting and cleansing agent which, in conjunction with caustic soda, is said to render valuable service in removing oil, grease and graphite from Helanca yarns and knit-goods.

SAPAMINE ® OC
(Ciba)
Is a new cationic softening agent developed specifically for producing a soft, smooth hand on Orlon yarns, knitgoods and other fibers.

* Registered Trade-mark

S D #70
(Laurel)
A sulfated ester which is solid to show excellent wetting and dye assisting properties. It is stated that is is also a fine rewetting agent, and an excellent assistant in the compressive shrinking of cotton fabrics. Has mild softening and lubricating properties and shows best results on cotton yarns and fabrics.

SECO #10
SECO #20
(Woonsocket)
A two-part one-bath water repellent for application to cotton and synthetic fabrics. It is said to give a soft hand with a minimum of mark-off and best repellency.

SECO FF
(Woonsocket)
A low viscosity one-bath renewable water repellent for application to cotton or rayon fabrics. It is said to give maximum repellency with a minimum amount of material.

SELLOGEN CONC
(Jacques Wolf)
This is a methyl tauride condensate. It is used as a universal detergent, especially good for all fibers. Sellogen Conc is stable in hard water, alkali and acid solutions, and in bleaching agents. It disperses lime soaps and prevents their depositing on the goods.

SEQONYX D EXTRA
(Onyx)
An entirely new neutral, stable complex inorganic polymer, said to possess outstanding sequestering efficiency, and unusual dispersing action. Useful in overcoming the harmful effects of hard water in textile processing. It is stated that it may be used advantageously in all types of dyeing because of its stability over a broad range of pH conditions; prevents scumming and improves dye dispersion and penetration.

SEQUESTROL S-100
(Berkshire Corp)

A noncolloidal organic chelating or complexing agent which resembles the polyphosphates in its ability to deionize heavy metal and alkali earth ions. It is stated that it is stable and effective over a wide range of temperature and pH, compatible with cationic materials as well as soluble in many semiaqueous and nonaqueous media.

SEYCO-BRITE K
(Seydel-Woolley)

Seyco-Brite K is used in textile mills as a kier assistant and boil-off assistant. It is a new synthetic, said to be exceptionally effective in aiding the penetration of caustic into the fibers, and to the leaf particles and motes, allowing a maximum of efficiency of action of the caustic in explosion and removal of these motes. It is stated that it is very stable to caustic solutions and will be very effective in concentrations anywhere from 1% to 6% of caustic soda or alkaline salts.

SEYCO-SAN EXTRA
(Seydel-Woolley)

An improved nonfogging, nonvolatile Sanforizing oil. It is compatible with starches, gums, many wetting agents and anionic materials in general. Seyco-San Extra is said to give a good soft hand, and to contain lubricants which give a lubricating action on the shoes of the Sanforizer. It is stated that it is characterized by its higher wetting and rewetting speeds, which give increased economy of operation, plus better assurance of rapid and uniform penetration of the spray.

SEYCO-TERGE NI EXTRA
(Seydel-Woolley)

Seyco-Terge NI Extra is said to be a very effective detergent for the removal of oily and greasy soils. It is nonionic in character, and is compatible with many other products that are used in textile detergency, whether anionic or nonionic. It is stated that Seyco-Terge NI Extra is a concentrated product and very small quantities are necessary to produce good detergent action. It may be used in cold or warm solutions, and is effective on cotton, wool, rayon and synthetics. In addition to the detergent properties of Seyco-Terge NI Extra, it is said to be an excellent emulsifier for such solvents as Varsol, Stoddard solvent, xylol, etc. Blends of Seyco-Terge NI Extra and these solvents are said to be especially effective detergents where the textile goods are highly contaminated with oils and greases.

SHOWERTEX
(General Aniline)

Showertex is a highly effective nondurable water repellent recommended for application on cotton, wool, rayon and mixed fiber fabrics. This product is an emulsion of waxes and metal salts which is applied either by padding or from long liquors. Showertex is said to produce outstanding water repellent effects without impairing the cloth's quality, appearance or hand.

SILIGEN A
(Nova)

A versatile finishing auxiliary for use as an anti slip and dirt resistant. It is an odorless liquid of neutral reaction, which is readily miscible with water in any proportion. It is unaffected by hard water. In view of its good stability, it may be applied at any temperature. It is compatible with most of the usual softening, creaseproofing, water-repellent and other finishing agents.

SIPEX* 806
(American Alcolac)

Developed for superior detergency, Sipex 806 is the sodium salt of a mixture of fatty alcohol sulfates. At temperatures above 45°C, it is said to exhibit very good scouring, wetting or penetrating action. When used for scouring synthetic fiber fabrics before dyeing it has the advantage of good rinseability. It is stated that, because it has very little effect on the dye bath if goods scoured are not rinsed completely, it allows better control of the dyeing operation. Sipex 806 is most effectively used when accompanied by alkaline builders.

* Registered Trade-mark

SIPEX* 860
(American Alcolac)

A specially modified lauryl alcohol sulfate detergent of high grease and oil emulsifying power combined with fast wetting and good soil dispersion. It is said to be an effective scouring agent for boiling off synthetic fabrics, cotton goods, and yarn in packages and skeins. It is also a dyeing assistant with strong dispersing and levelling power suitable for dyeing yarn and fabric. Resistant to acids and alkalies, and stable to salt in the dyebath, it is stated that it will not precipitate and form oil spots or dye spots on the goods. No residual salt deposit will be left on yarn after package dyeing. The product has a mild softening effect on textile fibers and will in no case leave them with a harsh hand.

* Registered Trade-mark

SIPEX* TN
(American Alcolac)

Higher alcohol sulfate paste for scouring and for soaping yarn and piece goods after fast color dyeing.

* Registered Trade-mark

SOFTENER R
(Rohm & Haas)

A cationic softener developed specifically for finishing of cotton fabrics containing 50% active ingredient. It may be used to impart lubricity, soft feel and higher tear strength on cotton fabrics. It is substitutive and is particularly useful to counteract the dry effect produced on cotton by durable thermosetting resins.

SOLASOL USP EXTRA
(Aceto)

Sodium lauryl sulfate USP Extra (powder form). This product obtained by sulfation of a distilled lauryl alcohol to insure a product whose alkyd group contains a maximum of C_{12} molecules. Suggested uses are: anionic wetting agents, manufacture of dispersing agents, cleaners, scouring agents, and penetrating agents. This product is also available in needle form as a solution to the problem of dust irritation.

SOLGENTS-200
(Woonsocket)

A new product involving the sulfonation of a variety of solvents. By this new method, an alkylarylsulfonate can be intimately or chemically combined with a nonpolar solvent such as xylol or varsol to form a water-soluble product said to possess both solvent and detergent properties. These products are highly foaming in water and either form true solutions or solutions of micellar construction.

SOLPON KD
(Pioneer)

A protein—fatty acid condensate. This fulling, dyeing and scouring assistant protects animal fibers against damage in alkaline processing.

SOLVEMUL
(Drew)

The new synthetic fibers have necessitated the use of solvents in scouring and dyeing.

Solvemul represents a superior emulsifier for solvents with excellent subsequent removal. The addition of 2½% to 5% Solvemul in solvent produces emulsions stable for a minimum of 48 hours.

SOLVEX #50
(Berkshire Corp)

A pine solvent detergent. Recommended by the manufacturers for cold scouring of woolen fabrics, emulsifying mineral oil, scouring of knit goods and as a rayon boiloff assistant.

SOLVEX #100
(Berkshire Corp)

A concentrated scouring auxiliary combining the desirable features of cresylic acid cold scours and synthetic detergents. Recommended by the manufacturers for scouring of wool stock containing a high percentage of grease and oil; as an addition to regular fulling soap formulations which will insure removal of oil and grease residues in woven goods.

SOROMINE* AT
(General Aniline)

Soromine AT is an amphoteric softener, in the form of a white paste, which is suitable for treating bleached, dyed or printed textiles. It is stated that its principal advantages are that it does not yellow bleached white and pale shade dyed fabrics and has little or no affect on the shade or light fastness of dyed fabrics. This versatile finishing agent gives excellent softening effects on animal, cellulosic and synthetic fibers. Soromine AT is a complex fatty amido compound. It is an ampholyte and can function as a substantive softener in acid liquors and as a relatively nonsubstantive softener in neutral or alkaline liquors.

* Registered Trade-mark

STANDAFIN* #92
(Standard Chemical)

Standafin® #92 is a water emulsifiable thermoplastic resin designed for application to acetate, rayon, and synthetic fabrics. It is said to impart body, nonslip properties, and does not affect luster. It is stated that it is particularly suitable for finishing of satins.

* Registered Trade-mark

STANDYE-FIX A
(Standard Chemical)

Standye-Fix A is a new type dye fixing agent in the form of a colorless liquid particularly designed to be used in combination with Stanset resin finishes. It is stated that it is not affected by sulfates, chlorides, or anionic surface active agents. It is said to provide a high degree of wash fastness to soaping of selected direct dyestuffs on both cotton and viscose rayon.

STANSET D-40
(Standard Chemical)

Stanset D-40 is a new type of chemical reactor resin for the stabilization of viscose rayon and cotton fabrics against shrinkage during laundering. It is said to provide a permanent crease resistant finish and hand with extremely low chlorine degradation and nonyellowing of white fabrics.

STANSET L C
(Standard Chemical)

Stanset L C is a new resin finish for the stabilization of cotton fabrics against shrinkage during laundering which is said to impart the following: extremely low chlorine degradation, good crease resistance, low cost finishing, permanent hand, and low temperature curing.

STANTEX* #934
(Standard Chemical)

Stantex* #934 is a water emulsifiable antistatic lubricant for Saran staple, yarns, and monofilaments. It is said to provide lubricity, antistatic properties, and has no adverse effect on the light stability of Saran. It is recommended for use in spinning and weaving.

* Registered Trade-mark

STRIPPING AGENT SOLUBLE CONC
(Nova)

A stripping agent for textiles. It is supplied in the form of a white water-soluble powder. This product has a very good reducing action. In acidic and neutral aqueous solutions it is stable for several days. It is stated that it does not tender any of the usual textile fibers and is therefore particularly suitable for stripping shoddy, reclaimed wool, wool, nylon, acetate rayon and mixed fabrics of all kinds. It develops its highest efficiency at 160-200°F (70-95°C) in presence of acids.

SYNTERGE 750
(Colloids)

A cocenut oil amide that is said to yield an exceptional detergent action, a stable emulsifying agent, excellent wetting and dye levelling properties based on all types of dyes or fibers in acid or alkaline media. It is claimed that Synterge 750 is an excellent all-round detergent and may be used in all processes including bleaching, scouring, stock or package dyeing, jig or box work, continuous scour operations. It is said to have excellent properties for removing after-wax on rayons, acetates or nylons. It is further said to be excellent as a base for solvent scouring or color dispersing or elimination of scums. Economical as the 100% product, but may also be purchased in 25%, 33-1/3% and 75% concentrations. Data sheet available.

TANALENE 200
(Tanatex)

A dye bath assistant which provides true lubrication with all fibers. Tanalene 200 is said to be so effective in this respect that it inhibits cracks and chafe marks and acts as a leveling agent for direct acetate and other dyestuffs and is fully compatible with practically every chemical encountered in wet processing textiles from a pH of 1 to 14. It is particularly suitable as a dyeing oil for the new synthetics, including Acrilan*, Dacron**, Orlon** and others.

* Chemstrand Trade-mark
** Du Pont Trade-mark

TANALON* B
(Tanatex)

The well known Tanalon carrier for dyeing Dacron** polyester fiber has now a companion product. The makers recommended Tanalon B for rayons and acetate blended with relatively small amounts of Dacron. Complete exhaustion and highest color values are said to be obtained with acetate dyestuffs. Spotting is eliminated. It is stated that one bath dyeings of Dacron, rayon and acetate are easily accomplished. Lightfastness and other properties of dyestuffs are unaffected.

* Reg U S Pat Off
** Du Pont Trade-mark

TANALON* C
(Tanatex)

A water dispersible carrier for dyeing Dacron** polyester fiber with wool. It is also useful

* Reg U S Pat Off
** Du Pont Trade-mark

in blends of Dacron with rayon, rayon acetate and other synthetics. Tanalon C is said to give higher color values than any other Tanalon product.

TANASOL B
(Tanner)

A wetting agent which also acts as a protective colloid for the fibers. Tanasol B is especially designed for chlorine and peroxide bleaching. It is said to be the optimum mixture of a glycol condensate and a protein fatty acid condensate. It is stated that it has exceptional ability to increase the efficiency of bleaching while the fabric retains very high tensile strength. This is especially noticeable on rayon.

TANATERGE ACID
(Tanatex)

This product is said to contain a minimum of 98% dodecylbenzene sulfonic acid. It is used as an emulsifier and raw material for alkylarylsulfonate detergents.

TANATERGE 60-L
(Tanatex)

A straw colored viscous liquid which is said to contain 60 per cent (±1) of an organic alkylarylsulfonate. A Clarkson-Draves test of 25 seconds wetting time is obtained with a .10% solution at 25°C. Tanaterge 60-L is said to be an excellent wetting agent for the desizing bath. The enzyme is said to be less affected by Tanaterge 60-L than by nonionics in the amount required to give the same wetting action. The product is also effective as a leveling agent in direct, acid and acetate dyeing.

TANATERGE SPECIAL
(Tanatex)

Tanaterge Special is an amber viscous liquid which is said to contain 26 per cent (±1) salt free alkylarylsulfonate with a modifier that increases the detergency to a remarkable extent. Tanaterge Special has good detergency on wool. In conjunction with sodium sulfate, trisodium phosphate and Tanasen 150 it is said to make an excellent bleach for cotton goods.

TELKANITE M
(Dexter)

This nonionic agent is claimed to be a highly effective stabilizing agent and assistant for all types of naphthol dyeing and printing. A nonionic agent, it has, according to data sheets, high stability and dispersing properties in acid medium which makes it particularly suitable for the pasting up and dispersing of bases.

TELKANOL O
(Dexter)

A nonionic dyeing assistant and leveling agent, Telkanol O is said to be especially effective on wool and for unions of wool and synthetic fibers such as spun rayon, Orlon, Dacron and nylon, as well as wool and cotton. A strong dispersing action is claimed for Telkanol O on oils and fats which makes this product an excellent scouring agent in the acid or alkaline scouring of wool and wool wastes. It is said to exhibit high resistance to acids, alkalies, salts and hard waters.

TERGENOL S LIQUID CONC
(Hart)

A clear liquid containing at least 33% sodium-N-methyl-N-oleyltaurate. It is said to possess exceptional detergency, good wetting, emulsifying and dispersing properties in addition to excellent stability to hard water, acid and alkali.

"TERGITOL"* NONIONIC NP-40
(Carbide and Carbon)

An alkyl aryl polyethylene glycol ether. Sp G, 1.076 at 40°/20°C; solidification temperature, 32°-33°C; cloud point of 0.5% aqueous sol, >100°C; sol in water, complete at 20°C; odor, mild; white solid. "Tergitol" nonionic NP-40 is a nonionic agent that is soluble in water at the boiling point or in the presence of high concentrations of dissolved electrolytes. Suggested uses: As a detergent and dispersant in high-temperature scouring and cleaning operations, where the effectiveness of other nonionics is limited by insolubility; as a leveling agent for dispersed dyes. Availability: commercial quantities.

* Trade-mark

TEXAPRET C NEW
(Nova)

A sizing and finishing agent. It is a highly viscous, yellow-brown substance and is supplied weakly ammoniacal-alkaline. It can be dissolved by simply pouring hot water over it and, if necessary, boiling up for a short time. If cold water is used, dissolving takes longer and requires thorough stirring. It is claimed to be a universally applicable finishing agent for all kinds of textiles. It imparts a full and firm hand.

TEXAPRET K POWDER
(Nova)

A white product which readily dissolves when in cold water and warmed up to approximately 60°C. The product is said to possess good stability to hard water, and to impart to the textile goods a firm hand. It is stated that it is well compatible with the usual sizing and finishing agents.

TEXAPRET NA
(Nova)

For finishing woven goods of all kinds. It is a yellowish liquid of low viscosity, with an alkaline reaction to litmus. It is stated that it can be diluted with hot or with cold water, that it is unaffected by hard water and that it can be applied in the presence of acids and alkalis. It is said to impart a full, firm hand to the woven goods. Its compatibility with other finishing agents is good. It is said to be specially suitable for finishing various synthetic staple fiber and cotton fabrics to obtain a full, firm effect.

TEXAPRET WL CONC NEW
(Nova)

A finishing agent for textiles. It is supplied in the form of a yellow, highly viscous substance It is soluble in cold water and the solutions have a neutral reaction. This product is unaffected by hard water. It may be employed in combination with a number of finishing and softening agents. It is stated that it imparts an excellent body to the material without stiffening it and that it does not affect the shade of dyed goods.

TOLUIDINES
(Carbide and Carbon)

A mixture produced by coal hydrogenation; contains more than 97% toluidines with ortho, meta, and para isomers present in approx 12:3:2 ratio; contains less than 2% tertiary nitrogen compounds and no nitro compounds as impurities. Avg MW, 108; Sp G, 0.9935 at 20°/20°C; Fr P, —43°C; distillation range, 197°-202°C; color, brownish-red. Chemical properties: Undergoes usual reactions of aromatic amines. Suggested uses: as special-purpose solvent; intermediate for dyestuffs (particularly those of the magenta series where unique distribution of isomers offers possibilities for interesting variations of shades), textile finishing agents, rubber accelerators, flotation agents; as an octane improver for motor gasoline stocks either with or without tetraethyl lead. Availability: development quantities.

TREPENOL* ES
(Treplow)

Chemically described as sodium alkylsulfate of higher alcohols — a paste detergent which is said to afford excellent water solubility and stability with good detergency.

* Registered Trade-mark

TREPENOL* S-60
(Treplow)

This product is a sulfated ester of an alkyl phenoxy polyoxyethylene ethanol. It is an anionic, high-foaming surfactant said to possess excellent wetting, dispersing, emulsifying and detergent properties. It has been designed for those cases where high, stable foam is desired in applications demanding good detergency, high wetting strength, easy emulsification and low cost.

* Registered Trade-mark

TREPENOL* WA
(Treplow)

Chemically, this product is sodium laurylsulfate. It is supplied as a sodium chloride free material or with sodium chloride. Said to be an excellent emulsifying agent with good detergency and stability properties.

* Registered Trade-mark

TREPOLATE* F-95
(Treplow)

A light-colored highly active (95% active) sodium alkylarylsulfonate in powder or flake form. This product is said to exhibit high calcium resistance and to be very effective in high acid or alkaline baths with good detergency and wetting power.

* Registered Trade-mark

TREPOLATE* T-60
(Treplow)

Chemically, this product is triethanolamine dodecyl benzene sulfonate. It is said to have excellent detergency, foam, wetting speed and surface tension reducing properties in aqueous solution.

* Registered Trade-mark

TRIOPEL S-100
(Burkart-Schier)

Durable silicone water repellent. Stable concentrated silicone emulsion. Instantly dispersible. Applicable to natural as well as synthetic fibers. Imparts good cutting and sewing qualities and pleasing hand and drape as well.

TWITCHELL* 7421 OIL (IMPROVED)
(Emery)

This product is said to provide all the necessary requisites of a modern fiber lubricant for woolens, worsteds and blends. This, it is stated, includes the control of static, excellent fiber lubrication, maximum resistance to yellowing, a high degree of scourability, low emulsion viscosities, high emulsion stabilities, and the inhibition of rusting. It is in the medium-price range.

* Registered Trade-mark

UNIPERAL W
(Nova)

Dyeing assistant when dyeing wool with metal complex dyestuffs. It is said to promote levelling penetration and improve fastness to crocking. It is a viscous brown mass, easily soluble in water. Solutions are neutral and stable to metal salts, acids and alkalis.

UVINUL* 400 AND UVINUL* 490
(General Aniline)

The Uvinuls are ultraviolet absorbers which are being brought out for use in coatings and finishes for natural or synthetic fiber fabrics. The Uvinuls are recommended for incorporation into coatings and resin finishes to protect textiles against fading and degradation caused by ultraviolet light. Uvinul 400 may be used when a colorless absorber is necessary, such as on white and pale shade fabrics. Uvinul 490 is effective in lower concentrations than Uvinul 400 and is recommended wherever its slight yellow cast can be tolerated. These products are substituted benzophenones.

* Registered Trade-mark

UVITEX® P CONC
(Ciba)

Is a water soluble optical bleaching agent developed specifically for the whitening of paper. It has outstanding affinity for bleached cellulose, and produces a brilliant, neutral white. This product may be applied by exhaustion in the beater or by padding or spraying at a subsequent stage of processing. It may also be applied in combination with coating mixtures.

® Registered Trade-name

VELVAMINE CA
(Refined)

A cationic softening agent which is said to give durable softness and pliability to natural and synthetic fibers and fabrics. It is further said to be resistant to discoloration on heating and exposure to light.

VELVAMINE NY
(Refined)

An anionic softening agent developed to impart a soft, full hand to natural and synthetic fibers and fabrics. It is stated that it is resistant to heat and light discoloration and will not affect the shade of dyes.

"VELVETOL"* WS
(Quaker)

A nonyellowing, nonionic softener said to be particularly useful for napped fabrics and for whites or pastels of cotton or rayon. It is claimed to be exceptionally resistant to discoloration or odor formation upon aging or heating. It is said to facilitate napping, giving better cover while preserving tensile strength.

* Registered Trade-mark

"VERSEN-OL"*
(Versenes)

Versen-OL is the trisodium salt of N-hydroxyethylethylenediamine triacetic acid. It is said to be a very effective agent for chelating trivalent iron from pH 7 to pH 10. It forms strong 1:1 ferric chelates. After chelating the iron it will then chelate other heavy metal or alkaline earth ions (liquid or powder).

* Registered Trade-mark

VIDASET AB
(Woonsocket)

A new cyclic urea resin for production of crease-resistant and durable embossed, Schreinered, or glazed finishes on cotton with a minimum of effect on tear and tensile strength. It is said to give a soft hand on cotton and rayon and to be an effective stiffener for hydrophobic fibers. Compatible with certain durable water repellents, softeners, and other resins, and with starches.

VIDASET P-4
(Woonsocket)
A new cyclic urea resin, similar to Vidaset AB but giving more body and stiffness on cellulosic fibers. May be used to produce full, rather firm, durable embossed, Schreinered or glazed finishes on cotton. Claimed to be very effective as a stiffening agent for hydrophobic fibers. Compatible with certain durable water repellents, softeners, and other resins, and with starches.

VISCOLAN 14
(Pioneer)
An oil to be used in viscose rayon manufacture to improve chemical and physical properties of the fibers. It is stated that, since tensile strength is appreciably increased, the product is especially recommended for tire cord.

VULCANOL* ACM-3250
(Alco)
A synthetic latex compound that has proven successful over a wide range of applications in the field of upholstered fabrics. Superior resistance to solvent and water spotting and adhesion to synthetic fibers are among the features claimed for this latex compound.

* Registered Trade-mark

VULCAFOAM AGL-9000
(Alco)
A natural-synthetic blended latex compound designed for use in the manufacture of foam rubber applied to fabrics. It is stated that users report faster curing times and greater tensile strength than formerly obtained with other blended latex combinations.

WARP SIZE CL
(Rumford)
A complete easily cooked sizing compound that requires no additives. It is said to give a tough, flexible film which reduces loom lint and is recommended by the manufacturers for cotton, linen, and viscose rayon. Can also be used as a piece goods finish without adjustment.

WAX EMULSION WG
(Laurel)
A mineral base wax emulsion for use on cotton, woolen, silk, and Orlon knitting yarns and sewing threads. It is applied to the yarn from emulsion troughs on cone winders. It is said to be stable and highly resistant to aging and will not change shades of dyed yarns. It is stated that this product will lubricate and condition the yarn for optimum knitting results. On sewing threads it is said to eliminate hot waxing processes and will insure an even stitch and reduce pull-ups.

WAX LUBE MB
(Laurel)
A solid wax recommended by the manufacturers for softening and lubricating yarns and fabrics. It is applied either as a water dispersion or a hot melt. May be used on silk, cotton, nylon and Orlon. It is stated that its high melting point makes this product ideal for overwaxing and similar applications. It is easily dispersed in hot water to form stable emulsions.

WEYTONE F P
(Tex-Chem)
A concentrated liquid flame-retarding and weighting agent. Weytone F P is said to produce excellent flame-retardance on cellulosic fibers and silk. It is claimed that it imparts a desirable weighted handle and does not cause harshness such as is encountered with many other flame-retardants. Weytone F P is anionic in nature and completely water soluble. It is compatible with most common types of anionc finishing agents.

WICACIDE 2160
(Wica)
Wicacide 2160 is recommended by the manufacturers for use in air conditioning, humidifying and cooling systems for the prevention of algae and slime. Cleaner water, air and systems, with less maintenance shut-downs are said to result from its use.

WICALOID 500
(Wica)
This product could be referred to as a "paint grade" type of latex, however, Wicaloid 500 has found application in the textile field where additional firmness and clarity of film are desired over the ordinary latices used.

WICALOID 1164
(Wica)
This product has a chloroprene base which, it is claimed, would tend to impart good oil and flame resistance as compared to the usual GR-S and natural latex products now in use. Wicaloid 1164 has been stabilized and adjusted for direct application in the finishing mill.

WICALOID 1166
(Wica)
A fully compounded product based on "nitrile" latex. This product has found application in the nonwoven fabrics trade and also is stabilized and adjusted for direct "roller coating" or "puddle coating" to upholstery and carpet fabrics.

WICALOID 1175
(Wica)
This product is characteristic in that it is compounded with "cold latex," enabling a greater degree of extension with inert fillers than the usual hot latices. Wicaloid 1175 has found wide application in the carpet trade.

WICALOID 1176
(Wica)
Wicaloid 1176 could be referred to as a "butyl rubber" and although not too much application work is being done in textiles with this product, it has certain properties that may be of interest. Wicaloid 1176 is said to give a very soft film having good impermeability properties towards gas diffusion.

WICALOID NM
(Wica)
A completely compounded pure gum product based on natural latex. This product is said to have excellent dry tack properties, and where nonskid qualities are important, this product would be well suited. Wicaloid NM also is said to have high tensile strength characteristics which would indicate its use as an adhesive where good bondage is required.

WICALOID P-1000
(Wica)
This is the first in a series of prevulcanized latices currently being offered for textile trade application. It is stated that the chief advantage of this type of product would be in that it requires no curing cycle and gives a completely cured, tough resilient film by merely drying the moisture from the product.

WICASAN PB
(Wica)
A blend of sulfated esters modified to provide excellent lubrication, fiber conditioning and softness as well as maintaining the usual fine degree of wetting and rewetting. This compound is said to be well suited to stock application in the opening and picking room, thus offering greater efficiency in subsequent plant operations.

WICASET 412-A
(Wica)
A 55% polyvinyl acetate emulsion particularly adaptable for textile and paper sizes and finishes. Its adhesive and bonding properties, and ready water dispersibility are said to be attractive to the wet processor. Medium particle size and emulsification system in manufacturing are said to contribute to excellent mechanical stability.

WICASET 417-A
(Wica)
A 30% solids copolymer of vinyl acetate. This copolymerization offers the wet processor an internally plasticized product of intermediate hand. Lack of migration, wide compatibility range and resistance of films to water, alkalies, acids, oils, fumes and ultraviolet are said to be noteworthy. It is stated that transparency, strength and excellent adhesion make for effective finishes where more durable hand changes are desired.

WICASTAT
(Wica)
A group of compounds recommended by the manufacturers for the purpose of reducing or eliminating static in synthetic fabrics and fibers. They may be applied by spraying or impregnating at most any operational point with less troublesome processing resulting. Specific compounds are available to fit individual plant conditions.

WICATEX 1000
(Wica)
A specially modified sulfonated vegetable oil recommended by the manufacturers to mills for use in dyeing, scouring and finishing baths. Its fine emulsification structure is said to provide for bath stability in conjunction with dyestuffs and other processing additives. It is free rinsing, nonharshening and compatible under varying pH conditions.

WICATEX 2173
(Wica)
An emulsifying, scouring assistant which is said to be particularly useful for the removal of grease and oil stains from synthetic fabrics. Readily soluble in water, free rinsing, and high temperature stability allow for continuous high speed operations.

WICATEX 3062
(Wica)
A self-emulsifiable solvent which is said to find especial merit as a swelling agent for polyester and acrylic fibers. It is readily water-dispersible, stable at high dyeing temperatures and free rinsing.

WICATEX 3105
(Wica)
A nonionic finishing agent designed to provide the utmost in lubrication and softness to synthetic fibers and fabrics, blends and cotton. It is stated that: it has excellent stability to acids, salts and mild alkalis; it does not affect color fastness or shade; and that it is compatible in dyebaths, sizes and with various resins.

WIXYN 100
(Wica)
This 100% active nonionic detergent was developed to provide a low foaming, high detergency, fine emulsification product that is said to be very effective at much lower temperatures than normally employed. Of course, still as highly effective at elevated temperatures. Especially recommended by the manufacturers for dyeing and scouring baths where fine colors must be protected.

WIXYN DOUBLE
(Wica)
A methyl taurate reaction product with the general formulation of $C_{17}H_{33}.CO.N(CH_3).C_2H_4.SO_3N_a$ which is designed to offer the textile wet processor an efficient product for detergency, wetting, scouring, soaping and dyeing. It is said to be stable under hard, soft, acid or alkaline water conditions. For economy of use, the purchaser may blend Wixyn Double with an equal amount of water to obtain the gel type that is popular in many mills.

WOONCO D-STATIC
(Woonsocket)
A water-soluble anti-static agent useful for application to synthetic fabrics alone, or in conjunction with resins. Has no effect on resin fixation or hand.

WOONCOFIX Z
(Woonsocket)
A new fixing agent to prevent cold water bleeding of direct colors between dyeing and drying. It is said to eliminate crows feet caused by color migration in the wet state. It is applied in the last rinse on dye box.

WOONCOLUBE
(Woonsocket)
A self emulsifying oil containing an antistatic agent for dual purpose application to wool/Dacron blends.

X-TAN-ASSIST
(Tanatex)
The product is said to eliminate many of the hazards and difficulties encountered in the use of sodium chlorite. X-Tan-Assist is said to prevent the corrosion of stainless steel, to control the development of chlorine dioxide and thus to eliminate the odors found in the use of sodium chlorite. X-Tan-Assist is reported to promote even wetting and bleaching.

EQUIPMENT

(Listed alphabetically according to manufacturer)

7-POWER FLASH-O-LENS
(Abbeon)

This instrument combines a 7-power Bausch & Lomb magnifying glass with a powerful light built into the handle, which clearly illuminates the magnified field of vision for the inspection of textiles.

One of the features that the manufacturer stresses is the instrument's lightness and portability. The new plastic housing for the lenses is made in such a form that the eye of the user can be placed directly over the work to be inspected. The Bausch and Lomb lens system is said to give a clearer, flatter field of vision and to reduce distortion and aberration. The battery casing is made of steel with a hard industrial chrome finish.

The complete unit is about 1" longer than a standard 2-cell flashlight. It utilizes regular 5 & 10c store dry cell batteries. Units can be supplied for 5-, 7-, 20- and 40-power magnifications.

7-Mag Flash-O-Lens (Abbeon)

POCKET pH METER AND PROBE UNIT
(Analytical)

This pocket-size pH meter and companion probe unit is said to permit instant, on-the-spot pH determinations aywhere.

Self-contained with batteries in a bakelite case 3" x 5⅞" x 2½", this instrument is furnished, camera fashion, in a case with plastic tubes of buffer and KCl solutions. Total weight is 3 lbs. Both waterproof and fungusproof, the case comes with a combination hand-and-shoulder strap.

Supports and beakers are eliminated by combining the calomel and glass electrodes with the sample holder in a single polyethylene probe unit. A sample volume of only 0.5 ml is required.

The meter is scaled from 2 to 12 pH, and a simple adjustment gives readings from 0 to 14. Accuracy of 0.1 pH is said to be obtainable. Hearing-aid type batteries provide up to 1300 hours of operation. The electrometer tube, switch and input connector are sealed in a single unit. The one-knob control and continuous reading features of this instrument simplify operation for untrained personnel. Grounded samples can be directly measured. The instrument and electrode are completely shielded.

BEAMING AND SEWING MACHINE
(Birch)

This machine consists of a metal let-off scray into which the small rolls of material are placed. This scray is fitted with an arrangement so that, as the end of the roll is reached, it does not jump up and out of the scray as sometimes occurs when some of the machines are being run at high speeds.

The machine is fitted with a railway sewing machine of either the chain-stitch or the butt-seam type, and the head is arranged to return to the beginning end automatically.

Following the sewing machine, there is an adustable tension device from where the material passes to a pair of driven rolls, which govern the speed tension, as well as the density of the center wound batch or beam of cloth.

The speed of the cloth being wound up is kept constant through use of a fluid drive arrangement.

When desired, the entering end of the machine is fitted with a pair of guiders.

2-ROLL SIZING MANGLE OR PADDER
(Birch)

The machine frames for this unit are of heavy welded construction on which are mounted a pair of rubber rolls or rubber and stainless steel rolls mounted in self-aligning roller bearings.

Pressure is applied by means of air cylinders to whatever degree desired. The pressure being applied on each end of the top roll is registered on gauges so that the actual pressure applied may be known at all times and a uniform or unbalanced pressure maintained.

The machine is fitted with a stainless-steel pan having three immersion rolls, and the pan is adjustable in height, so that the material being run may be immersed and run through the nip or fed straight through the nip with the bottom squeeze roll revolving in the liquor, thus feeding it up to the material being run.

To eliminate slippage the bottom and top squeeze rolls are geared together by roller chain. The drive is by a motor through a variable speed unit.

The nip is guarded by an electric eye, which, when the beam is interrupted, stops the machine and raises the top roll. The machine may be used for padding, sizing, resin treatment or extracting, etc. It is made in 5-, 10- or 15-ton capacities.

Modifications are made to suit any particular application. The machine is made in widths up to 20 feet.

C & R TESTER
(Custom Scientific)

The C & R Tester was designed for versatility. By a selection of pressure feet this instrument reportedly will meet many ASTM specifications for thickness.

The thickness measurement is made with a preload of ⅓ oz on the sample. The indenting load is transferred from a ball-bearing support to the indenting plunger by means of a screw, and handwheel. With this arrangement the indenting load (dead weight) may be applied to the sample without impact to measure the compression and removed to measure the recovery. Standard weights supplied with the tester are up to and including 2 lbs. The minimum indenting weight is 2 oz. Heavier weights may be obtained at an additional cost. The choice of one of the following pressure feet may be had with the Tester: ⅛", ¼", ⅜", and 1.129" diameter. Additional size pressure feet will be supplied upon request.

The Dial Indicator supplied with the instrument is graduated in .001 inches. The indicator may be raised or lowered by means of a screw and handwheel to have range of from 0 to 1-inch thickness.

The frame of the tester is of heat-treated cast aluminum. From 5 to 7 lbs indenting load may be applied with a maximum deflection of .0005 inch using a 7 lb load.

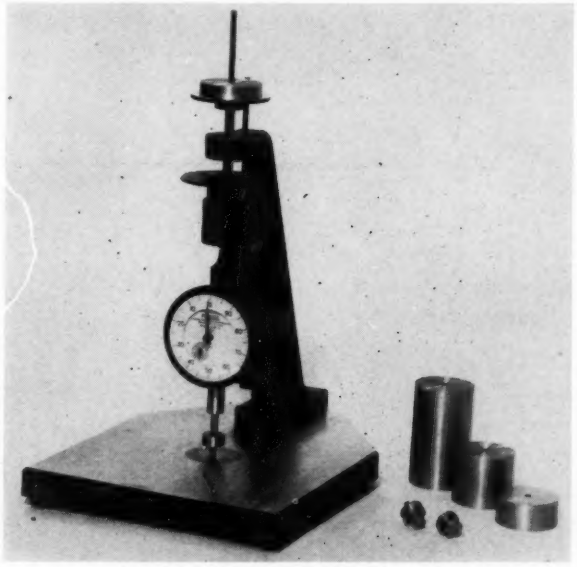
MICROSCOPE STAGE/TOOLMAKER'S MICROSCOPE
(Custom Scientific)

Custom Scientific Instruments is now able to offer a Microscope Stage or Toolmaker's Microscope with a range of 3" x 12". Accessories available with the Stage are dead centers, dividing head, and rotary table. The ground precision screws are mounted in ball bearings with an adjustable take-up nut. The accuracy is reported to be .0005" in the 12" range and .00025" in the 3" range. The stage can be purchased with or without the microscope. The microscope furnished with the unit is a B & L Stereomicroscope with 10X eye pieces and 2X—4X objectives.

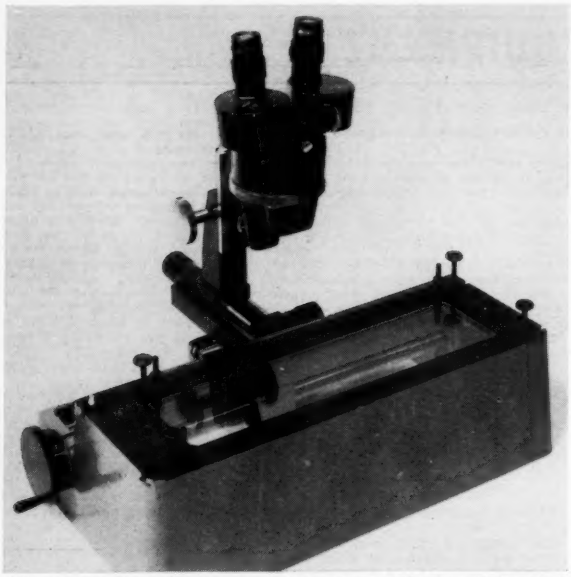
PILLING TESTER
(Custom Scientific)

This tester is the same basic design as the unit designed by Du Pont, but the drive has been modified to reduce cost of construction. Basically, it tests the pilling tendencies of small piece of fabric in a relative short length of time by utilizing a circular rubbing motion to produce pills.

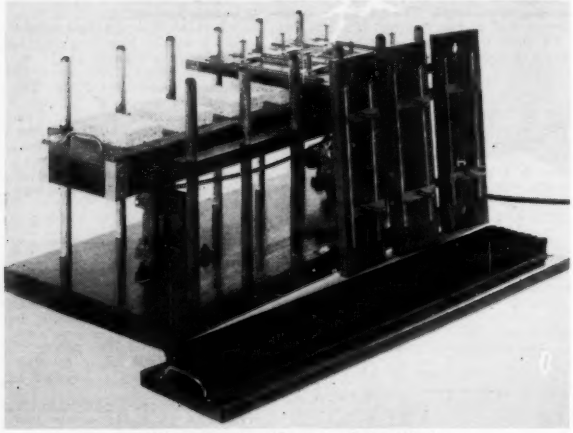
The standard model consists of a table which is driven by a ratiomotor and a jack shaft at approximately 56 rpm and a ¾" radius. Two rubbing surfaces are provided, one with cellulose sponges and the other with a nylon brush. Both



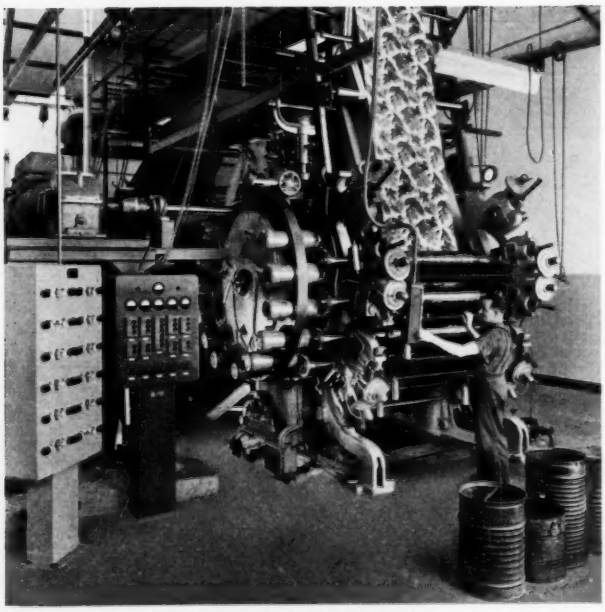
C & R Tester (Custom Scientific)



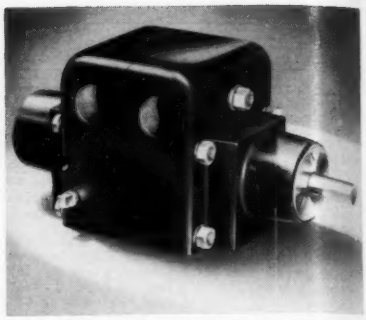
Microscope Stage/Toolmaker's Microscope (Custom Scientific)



Pilling Tester (Custom Scientific)



Printmaster 1954 (Deck)



Rubber-Chem® Pump (Eco)

the radius of rotation and the rubbing may be varied.

No general test procedure has been developed which is applicable to all types of fabrics. For loosely constructed knit fabrics, the brushing step is usually omitted and the tests made by rubbing the sponges for a given length of time, usually 5 minutes. For clear finished woven fabrics, a satisfactory test procedure is to brush the fabrics for a given time, usually 5 minutes and to follow this with a period of rubbing with the sponges, also usually 5 minutes. Blended fabrics containing wool frequently pill more by the above procedure than in wear. Fabrics of this type can be tested by using only the sponges and rubbing for a series of time intervals and noting the pilling after each interval. Fugitive finishes and other added materials effect the pilling propensities of new fabrics so that pilling before and after washing and/or drycleaning frequently gives valuable information. This tester can be used as a control tester for fabrics in commercial production or as a research tool in the development of new fabric constructions or in studying variations in manufacturing processes.

PRINTMASTER 1954
(Deck)

The Printmaster 1954, the latest in the manufacturer's line of Printmaster roller printing machines, features newly remodeled drying equipment, comprising a corrugated "Darex" surface blanket optionally combined with the Darex washing and drying machinery, and many other constructional details for increasing and improving the machine's output.

According to the manufacturer, engraved rollers can be speedily exchanged—for example, one hour is required to change a 12-roller design.

Other advantages cited: resilient pneumatic pressure provided for producing uniform prints, automatic registration effected by differential gear with separate motor, steered by a push-button device in both directions; a single driving (registering) wheel adjusted for printing rollers of various diameters (375-600 mm), thus eliminating need for auxiliary pinion wheels; open ball gearings for axels of the printing rollers; lifting and lowering arrangement for the main pressure cylinder, operated by flange motor, also separate motor acting on the two longest engraved rollers for lifting and lowering them together with the chassis.

ALL-CHEM® PUMP
(Eco)

The All-Chem pump is an all-Teflon and stainless steel unit for laboratory, pilot-plant and small chemical feeding in production. Said to be completely corrosion resistant, the All-Chem pump exhibits continuous flow pattern characteristics. It is recommended by the manufacturer for clear and viscous fluids, emulsions, and solutions in the widest pH ranges, and it is said to be particularly advantageous in the handling of such hazardous liquids as nitric and other acids, hydrogen peroxide and aromatics.

This multipurpose, positive displacement pump reportedly is easy to disassemble for cleaning, has high suction lift, may be operated in either direction, and is self priming. *Type pump:* positive displacement with two opposed axially oscillating impellers equivalent to duplex piston operation. *Volume:* ½ to 10 gpm at 1750 rpm (water). *Suction lift:* Highest over widest temperature and viscosity range. *Pump operating characteristics:* Linear delivery. No air entrainment and nonfoaming. *Drive:* Applicable to direct motor drive at 1750 rpm, as well as to all other standard driving methods.

CENTRI-CHEM® PUMP
(Eco)

A low cost, type-316 stainless-steel centrifugal pump for handling virtually every corrosive, in

Pilling and Abrasion Tester (Fabric Development)

any concentration, commonly employed in the textile industry. Incorporating the most advanced design principles, the Centri-Chem pump reportedly can handle abrasive as well as clear fluids without turbulence or surge. The new unit is said to be dynamically balanced, precision machined and unusually quiet in operation. A chemically inert pyrex cover plate gives full visibility of fluids being pumped and eases access to all internal parts if cleaning or maintenance becomes necessary. *Capacities:* up to 25 gpm, max at 3450 rpm. *Heads:* up to 55 ft max. *Suction pressure:* up to 15 in vacuum, max.

RUBBER-CHEM® PUMP
(Eco)

A unique synthetic-rubber pump for use with chlorine-bearing fluids, such as water, hydrochloric and other acids, plus many alkalies, and organic and inorganic fluids compatible with synthetic rubber.

Quality features of the pump include rugged construction, age-cured, fully stress-relieved synthetic-rubber casing, and stainless steel or Monel internals. All parts are interchangeable, size for size, with Eco All-Chem® stainless steel pumps and standard bronze process pumps. Impellers are available in Du Pont Neoprene, Hypalon, Teflon or Hastelloy. *Capacity:* up to 10 gpm and pressures to 100 psi in sustained service at 1725 rpm. Other features include high suction lift, safety self-priming design and linear flow.

DRAPE AND FLEX STIFFNESS TESTER
(Fabric Development)

Developed for the U S Navy Clothing Supply Office, the Drape-Flex Stiffness Tester (pat pending) measures how a fabric drapes under its own weight and how stiff it feels when flexed in the hand.

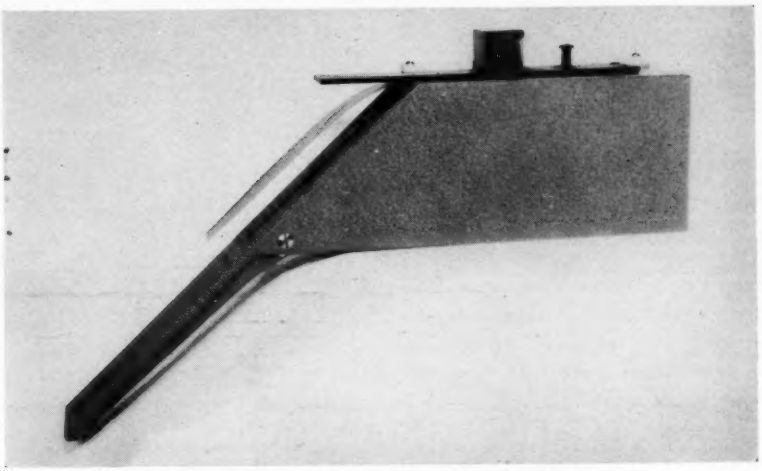
Published reports have shown the tester to be sensitive, accurate and easy to operate. Results are said to show good correlation with fabric "hand" and puckering in sewing.

Because of its simplicity and ease of operation the Drape-Flex Stiffness Tester is useful in developing and controlling constructions, chemical finishes and finishing procedures in mills and processing plants. Materials tested include knit goods, shirting, mechanical fabrics, supported and unsupported films, suiting, coated fabrics and reinforced sheet plastic.

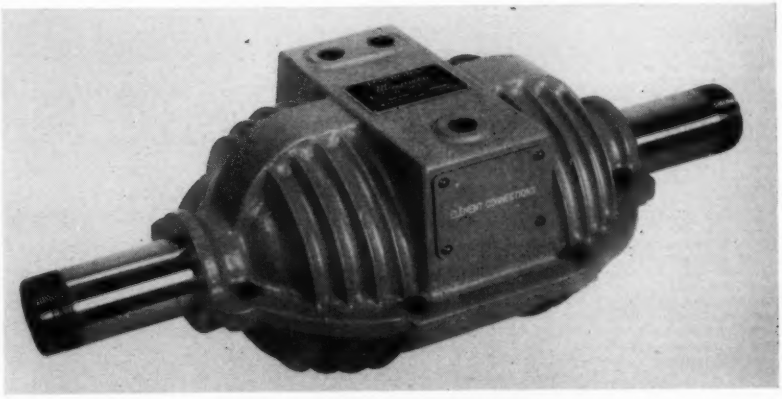
PILLING AND ABRASION TESTER
(Fabric Development)

Known as the PA model of the Appearance-Retention Tester (pat pending) originally developed for the U S Navy Clothing Supply Office, this new tester reportedly has shown excellent correlation with actual "pilling" and wear. With it, most "pilling" tests take only one to five minutes and are quickly evaluated by comparison with simple photographic standards. Surface wear of fulled, napped, pile or ornamented fabrics or abrasion of woven and knitted fabrics are tested under carefully controlled conditions with the test sample in a normal undistorted state.

Special features of the new tester are said to include reduced operating cost, its suitability for nondestructive testing of garments, means for quickly and uniformly mounting samples without tension, magnetic sample holder control, and an automatic timer. It is recommended by the manufacturer for general use in fabric development, mill and finishing plant control and acceptance testing.



Drape and Flex Stiffness Tester (Fabric Development)



Magnetic Flow Meter (Foxboro)

MAGNETIC FLOW METER
(Foxboro)

This new electromagnetic flow meter, designed for 2" to 8" flow lines, incorporates all the advantages of electromagnetic metering. The instrument is additionally rated for unlimited maximum flows, making practical a number of flow measurement applications impossible with ordinary metering equipment.

The manufacturer points out that the Foxboro Magnetic Flow Meter will measure the volume flow rate of any liquid of sufficient conductance and velocity. It is said to be unaffected by the pressur,e viscosity, density or changes in conductivity of the flowing liquid.

The unit is said to be an excellent device for accurately checking the rates of flow on package and beam dyeing machines. Equipped with a number of inexpensive range change units, the instrument reportedly provides full-

Model 12A Temperature Transmitter (Foxboro)

scale deflection of the recording pen for any range of flow. For example, a transmitter unit of six-inch line size can be used to measure flow through any size pipe in any system having a minimum flow rate of 450 gpm. Any flow rate greater than this can be specified.

The meter can also measure reverse flow by simply interchanging the leads to the instrument, or by calibrating the instrument to read center scale for zero flow conditions, it will measure flow in either direction.

Complete information is contained in the manufacturer's technical report 27-A-71A.

MODEL 12A TEMPERATURE TRANSMITTER
(Foxboro)

This new instrument measures process temperatures and pneumatically transmit the information to a central recording or controlling station. It is a nonindicating device of the "force balance" type with a calibrated accuracy of ½% of the temperature span and compensated for ambient temperature and barometric pressure variations.

A recent installation of the 12A Temperature Transmitter involves automatic temperature control for the slashing of warps, with temperatures transmitted from the slasher and starch cook to the master control panel 270 feet away. With this type of transmission it was possible to use space-saving Consotrol graphic panel type recording controllers with nine of these units mounted in less than nine square feet of panel area.

SHEAR-FLOW
(Gabb)

This new industrial unit was developed by Edward Koch of Lisbon, Conn, as a mixer which would handle the heavier type ink pigments when mixed with clears or extenders used in the printing of textiles. It embodies an entirely new principle for dispersing the heavier pigments.

HUNTER CONE REEL WASHER
(Hunter)

Through further study of its Flexreel Washer, Hunter has developed the Cone Reel Washer, a machine for washing cotton fabrics in rope form at high speeds. The manufacturer points out that the operator can immediately adjust the Cone Reel Washer to handle any weight fabric from very light lawns to heavy bark-cloths. This is accomplished through the use of a series of cone reels driven on a common shaft, together with air-operated positioning pins which control the position of each fiber strand on the periphery of its own cone reel. Through this method, and with the use of an internal compensator, any degree of tension necessitated by the weight of the fabric can be obtained.

NOTE: For an illustration and further discussion of Hunter's Cone Reel Worker, see page 878 of this issue under "Bleaching."

Shear-Flow (Gabb)

IMPROVED CLOTH SOAPING MACHINE
(Hunter)

This improved, more efficient version of Hunter's Cloth Soaping Machine employs a new Rotochamber Squeeze Roll Pneumatic Pressure System. The machine is said to provide the solution for the two major problems involved in cloth-soaping techniques through the extreme accuracy of its control of the soap content of the cloth, and its maintenance of a uniform soap content from lot to lot. It is pointed out that the redesigned machine will completely eliminate the labor formerly required in manual soaping operations, while reducing soap costs as much as one half. The reason given for the reduction of soap costs is the utilization of small-capacity tanks which provides faster circulation of the soap, thus cutting down soap loss at the end of a run.

Through the use of a counterflow, the soap supply is kept free of impurities on up to the last squeeze. This is said to result in extremely bright whites and unusually vivid colors. Stainless-steel construction throughout the machine is said to greatly reduce maintenance and cleaning operations, and specially designed stainless-steel splash guards deflect splash back into the tank to keep the surrounding floor area dry.

BLEACHING RANGETTE*
(Rodney Hunt)

In collaboration with Becco and Du Pont, Rodney Hunt has developed the continuous Bleaching Rangette to meet the demand for the efficiency of the continuous bleaching range in operations from 240 to 1500 pounds per hour.

It is pointed out that the judicious selection of Rangette size Tensitrol® Washers, saturators, and J-Boxes allow a choice of standard equipment to meet any production requirement at a low capital investment, and can be arranged in a floor area space as small as 15 x 21 feet. Production capacity is said to be completely flexible from 30 yards per minute up to capacity of the smaller conventional bleaching ranges.

Light or heavy fabrics reportedly can be handled continuously in quantities of 240 to 1500 pounds per hour—even more under most conditions, if full-size units are combined with Rangette units.

Rodney Hunt Bleaching Rangettes incorporate the advantages of the patented Tensitrol Washer which, by relaxed conveyance of the fabric, is said to permit extraordinary penetration of water and high elimination of chemicals from the rope.

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* A trade name of the Rodney Hunt Machine Co.

NIPTROL* PNEUMATIC MANGLE
(Rodney Hunt)

Uniform pressure regardless of width of roll face, superior extraction, and process flexibility are cited as some of the main virtues offered by the new Rodney Hunt Niptrol* Pneumatic Mangle, which is said to be especially suited for such processes as extraction, simultaneous extraction and starching, dyeing, and resin and other chemical applications. The Niptrol Pneumatic Mangle, on which patents are pending, is said to give versatility, efficiency, chemical economy and remarkable product quality.

The Niptrol machine is claimed to be he only mangle ever devised which will give absolutely uniform pressure across the full width of the nip. Its pneumatic loading system is said to compensate for any squeeze roll deflection, the principle problem experienced in conventional mangles.

See page 673 (September 27th issue) of the American Dyestuff Reporter for a more complete discussion as to how the "Pneumatic Mangle Solves Many Dyehouse Problems".

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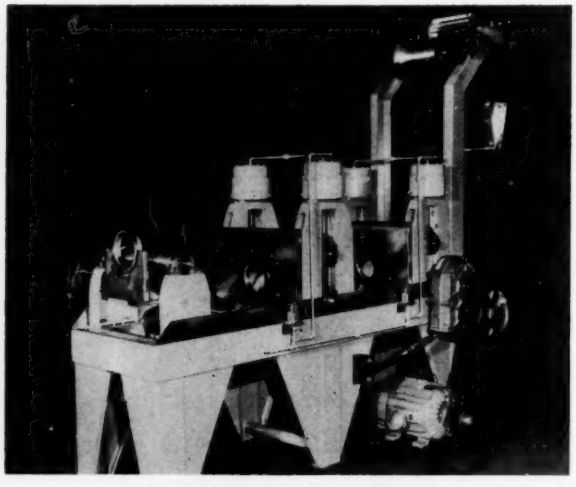
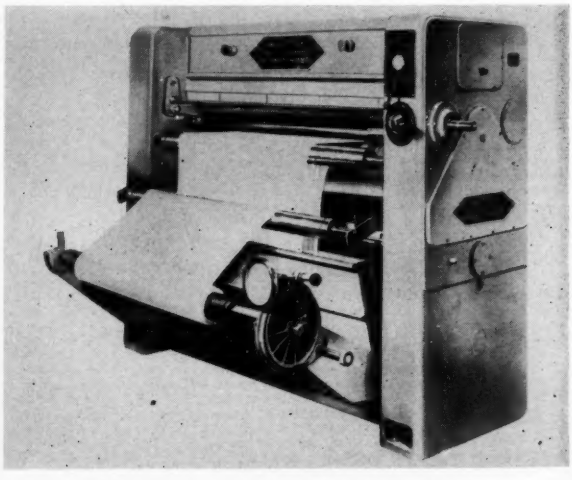
* A Trademark of the Rodney Hunt Machine Co.



Cloth Soaping Machine (Hunter)



Niptrol Pneumatic Mangle (Rodney Hunt)

"HIGHLIGHTS OF THE PAST YEAR" by P J Wood appears on page 877 of this issue.

Proceedings of the

American Association of Textile Chemists and Colorists

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Editor of Proceedings: Carl Z Draves, 30 Lahey St, New Hyde Park, N Y

DECEMBER 6, 1954

MEMBERSHIP APPLICATIONS

November 5, 1954

STUDENT

James A Varner — Fairleigh Dickinson College: Sponsor: H R Mauersberger.

Joseph Barocas—Philadelphia Textile Institute. Sponsor: W H Hughes.

Arie Brodman—Philadelphia Textile Institute. Sponsor: W H Hughes.

Adeline M Hoffman—Philadelphia Textile Institute. Sponsor: W H Hughes.

David A Singer — Georgia Institute of Technology. Sponsor: W Postman.

Edgar I Broadhead—Rhode Island School of Design. Sponsor: H B Sturtevant.

Gordon H Howard—Rhode Island School of Design. Sponsor: H B Sturtevant.

Rodney W Kingirski — Rhode Island School of Design. Sponsor: H B Sturtevant.

APPLICATION FOR TRANSFER TO SENIOR MEMBERSHIP

James A Baird
Hugh W Barrow
Robert Lee Burgess
Robert M Creegan
Lawrence C Gardner
Lloyd C Harmon, Jr
Luther V McMackin, Jr
Edward J Mendell
Robert R Mercer, Jr
Malbourne G Michael
Joshua B Monego
Joseph D Noonan
Anthony L Perrin
Gaston M Randolph
Robert R Stewart, Jr
Robert W Sumers
Walter N Thibodeau
George T Womack
Joseph M Zambo

November 16, 1954

SENIOR

Roy H Boggs—Textile chemist, Union Bay State Chem Co, Southern Laboratory, Greenville, S C. Sponsors: J Lindsay, Jr, J H Langston.

Charles H Briner—Supt of dyeing, Cincinnati Dyeing & Specialty Co, Cincinnati, O. Sponsors: J Nerl, L B MacFarland.

Nicholas M Canaris—Textile chemist (research), Waldrich Co, Delawanna, N J. Sponsors: F S Richardson, J A Komninos.

Vincent P Clarke—Dyer, Waumbec Dyeing & Finishing Co, Manchester, N H. Sponsors: L Zumpfe, A McNulty.

Helen E Fortner—Lab manager, Alden's Inc, Chicago, Ill.

Florence H Forziati—Chemist, National Bureau of Standards, Textile Section, Washington, D C. Sponsors: L Smith, N F Getchell.

Sheldon Goldman—Textile chemist, Royal Yarn Dyeing Corp, Brooklyn, N Y. Sponsors: L J Roos, C Schoener.

Maurice Lagasse — Purchasing manager, Grands Magazins Uniprix Priba, Brussels, Belgium. Sponsors: E Freedman, N A Johnson.

John R Mauney, Jr—Asst to manager, Karastan Rug Mill, Fieldcrest Mills, Inc, Leaksville, N C. Sponsors: N F Young, J F Byrd.

Roland O Meyer—Director sales service res, Holland Color & Chem Co, Holland, Mich. Sponsors: W D Paine, T A McCormack.

James J Monastero — Fine Gauge Knit Wear Co, Cleveland, O. Sponsors: W Adler, F Conrey.

William W Murphy—Assistant to foreman, chemist & colorist, P H Hanes Knitting Co, Winston Salem, N C. Sponsors: L H Roane, R L Miller, Jr.

Charles E Neale—Chemist, The Apponaug Co, Warwick, R I. Sponsors: G H Wood, E H Gamble.

Bernard M Phelan — Technician, Allied Chem & Dye Corp, Nat Aniline Div, Buffalo, N Y. Sponsors: M A Cullen, J F Mahoney.

Sava J Schaeffer—In charge of yarn & raw stock dyeing, Dominion Woolens & Worsteds Ltd, Hespeler, Ont, Canada. Sponsors: C A Whitehead, S I Birnbaum.

Joseph M Schwartz—Sec, vice-pres, Harry Schwartz Yarn Co, Inc, North Bergen, N J. Sponsors: M Siegel, S Levin.

Peter R Seargeant—Textile chemist-finisher, Bruck Mills (Aust) Ltd, Victoria, Australia. Sponsors: C August, A D Piesse.

Michael J Spencer — Colorist, Greenville Finishing Co, Greenville, R I. Sponsors: G L Roberts, A R Sims.

JUNIOR

Stephen T Dougherty — Chemist, United Merchants & Mfrs, Glasgo Fin Co, Glasgo, Conn. Sponsors: G A Fine, L F Dowling.

ASSOCIATE

Clareance W Beaman — C W Beaman, mgr, Productos Quimicos Robea, S A, Havana, Cuba.

Chester A Dziadzio—Lab assistant, Waumbec Dyeing & Finishing Co, Manchester, N H.

Robert C Funk—Senior medical technologist, Detroit Dept of Health Lab, Detroit, Mich.

Eikichi Itoh—Chairman of the board of directors, E Itoh & Co (America), Inc, New York, N Y.

Franklyn I Sheps—Sales mgr, Productos Anilinas Americanas de Cuba, S A, Havana, Cuba.

Henry G Withers, Jr — Chemist, Erwin Mills, Inc, Cooleemee, N C.

CALENDAR

(A general calendar of events may be found on page 880)

COUNCIL
Jan 21 (Hotel Statler, New York), Apr 15, June 17.

NATIONAL CONVENTIONS
Sept 22-25, 1955 (Chalfonte-Haddon Hall, Atlantic City, N J; 1956 (Waldorf-Astoria, New York); 1957 (Boston).

HUDSON-MOHAWK SECTION
Jan 14, Feb 25, April 15 (Albany, N Y); May 20 (Ladies Night); June 24 (Annual Outing).

NIAGARA FRONTIER SECTION
Jan 14 (Buffalo); Mar 4 (Hamilton, Ont); April 22 (Buffalo); June 24 (Outing).

NEW YORK SECTION
January 28 (Georgian Room, Hotel Statler, New York); February 25 (Skytop, Hotel Statler, New York); March 18, April 22, May 20 (Kohler's Swiss Chalet, Rochelle Park, N J).

PIEDMONT SECTION
Jan 29 (Poinsett Hotel, Greenville, S C); Apr 30 (Robert E Lee Hotel, Winston-Salem, N C); June 10-11 (Mayview Manor, Blowing Rock, N C); Oct 29 (Hotel Wm R Barringer, Charlotte, N C).

WASHINGTON SECTION
Feb 11 (Washington); May 20.

WESTERN NEW ENGLAND SECTION
Jan 28, Mar 18 (Rapp's Restaurant, Shelton, Conn); May 13 (Ladies Night); June 17 (Annual Outing); Sept 16 (Rapp's); Nov 4 (Hartford, Conn); Dec 16 (Rapp's).

*AATCC Research Newsletter No. 18

NEWS IN GENERAL

The development of a completely new approach to Corporate Membership extension is now in its final stages. It is expected to be ready for activation following its approval by the Council at its next meeting on January 21.

The new CM program includes a new type of application form—a four-page folder containing information on the objectives of AATCC research, its benefits to Corporate Members, and the accomplishments of AATCC. Also included is a new dues schedule based on dollar sales and relative interests of firms in AATCC research. A major announcement of the program will be made to the textile industry at a press conference to be held in the latter part of January.

The Executive Committee on Research approved in principle the proposal that AATCC sponsor the investigation of procedures for evaluating the effect of textile products on human skin. A committee will organize shortly with representatives from the American Medical Society and other interested groups to begin work on the project. Anyone especially interested in this subject should contact ECR chairman L S Little.

Dr Stephen J Kennedy, research director of the Textiles, Clothing and Footwear Division, Army Quartermaster Corp in Natick, Mass, has expressed willingness to cooperate with AATCC Research in the investigation of some aspects of the relationship of AATCC test results and end-use. The subject will be further explored and a clear definition of research objectives drawn up looking toward a mutually acceptable program of cooperation. ECR feels that the Army's long experience in field testing will be of valuable assistance in AATCC's own development of procedures for end-use studies.

AT RESEARCH HEADQUARTERS

Two of our friends from across the border recently visited AATCC headquarters in the persons of R F Taylor, Monsanto Ltd, Montreal and D E Laurin, Monsanto Ltd, Toronto. Dr Stiegler again reminded that everyone, whether from near or far, is most welcome to visit the research labs and other facilities AATCC has at Lowell.

Research associate George Mandikos attended the recent meeting of the Committee on Water Resistance. He has done some excellent work on a new method for measuring the dynamic absorption of water-resistant fabrics, a method that has attracted considerable interest among groups in the ASTM, Army QM and private industry. A report on much of this work by Mandikos was published in the June 21 issue of American Dyestuff Reporter.

Research director Harold Stiegler is preparing a list of consumer interest test methods which are not now included in CS 59-44. The list is intended for use as a reference for future revisions of the Commercial Standard 59. Prepared for the convenience of users of the standard, the list will give references to tests other than those published.

COMMITTEE ACTIVITIES

Max Winkler, chairman of the Committee on Abrasion, reported the setting up of a special study group to investigate the correlation of abrasion results obtained by different laboratories with the Accelorotor. Good correlation was obtained in one laboratory with what had been done originally in AATCC labs. In view of this, he said, they are inaugurating the large group to complete the work.

The Washfastness Committee headed by Jim Fynn has completed work on the effect of alternate sun and washing on colorfastness using the 3A test. Pending the publication of results, work is going ahead on the 2A and 4A laundering tests. The Committee is also studying the effect of synthetic detergents vs soap, and optical bleaches.

George Slowinski will again head the Committee on Water Resistance of Fabrics at the termination January 1 of C R Bellwood's three years in this post. Jim Redman takes over from L L Heffner for the same reason as head of the Committee on Fire Resistant Textiles. Frank O'Neil now chairmans the Committee on Color and George W Wernz does the same for recently formed Committee on Test Fabrics.

* Published every other issue of the American Dyestuff Reporter

1953 Intersectional Contest—— Third Prize Winner

LEVELING UNEVENLY DYED MATERIAL*

PHILADELPHIA SECTION, AATCC

The objective of this paper is to provide the dyer with information regarding the means of promoting migration by the use of special methods or auxiliaries.

The investigations were instigated by such considerations as the need to level uneven dyeings on wool or protein fibers instead of stripping them by chemical discharge so as to preserve hand and tensile strength. Since vat-dyed cotton cannot be discharged, an effective leveling method is also desirable for that fiber. With regard to hydrophobic fibers, relief must be found from the high cost of stripping in terms of chemicals, machine corrosion and loss of large quantities of dyestuffs.

Migration systems were studied with various classes of dyestuffs on wool, cotton, nylon, Dynel, Acrilan, Dacron and Orlon. In all, sixteen classifications covering innumerable auxiliaries and chemicals were tested, and evaluations are shown in tables, graphs, and windings of the relative effect of these on migration.

INTRODUCTION

THE primary objective of dyers in the application of dyestuffs to textile materials is not only to get the proper shade, but also to get the same shade throughout. Unfortunately, occasions arise when, through human or mechanical failure, dyeings are spotty, streaky or shaded.

The following investigations were instigated by such considerations as the need to substitute the leveling of an uneven dyeing for oxidation or reduction discharge stripping of the dyestuff with subsequent redyeing to shade. When unevenly dyed protein fibers are stripped for redyeing, in addition to loss of hand and lower tensile strength, the fiber has increased affinity for dyestuffs, a condition conducive to a repetition of the original unevenness. With regard to unevenly dyed hydrophobic fibers, relief must be found from the high cost of stripping in chemicals, machine corrosion and the loss of large quantities of dyestuffs *(1)*. With cellulosic fibers, where chemical-reduction stripping has little or no deleterious effect, our chief concern is the leveling of the nondischargeable vat dyes.

A further consideration that prompted this work on leveling was the expectation that any results which would produce

* Presented by V T Hartquist at Chicago, Ill, on Sept 19, 1953. Ms submitted to Am Dyestuff Reptr by the Editor of Proceedings on Sept 13, 1954.

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better leveling of unevenly dyed fabrics could also be related to application formulas. In practice, all dyeings begin with parts of the fiber material being more heavily dyed than others, level results being attained through subsequent migration of the dyes.

The attainment of macroscopic levelness, or uniformity of dyeing has been a continuous problem in dyeing and the subject of numerous investigations. In 1899, Hallet *(2)* made the observation that there is a close relation between the level-dyeing property in an acid color and the amount of color left in the dyebath. In 1937, Goodall *(3)* showed the effect of aggregating or dispersing effects on the removal or desorption of wool dyes. A bibliography of 28 articles relative to unlevelness was published by Gunther *(4)* in 1949.

Taking the same point of view as Hallet are Justice and Ewing *(5)*; others have seen a more complex situation. Ris, Stocker and Thommen *(6)* point out that migrating power and rate of exhaustion are involved. They define the migrating power of a dye as "the property which enables it to migrate from more heavily dyed to less heavily dyed parts of the material in a dyebath which contains the additions necessary for absorption."

The numerous factors in leveling include such diverse effects as temperature, rate of desorption, rate of both absorption and desorption diffusion, number of sites available for dyeing, particle size, aggregation of dyes, type and concentration of electrolytes, pH, swelling and auxiliaries.

There has been a tremendous increase in the number of auxiliaries, mainly surface-active agents, in the past three decades. Besides their own effect they also influence many of the variables mentioned. The integrated effect of these auxiliaries on level dyeing of both the natural and the newer synthetic fibers is the object of this study.

The auxiliaries chosen were those recommeded as dyeing assistants as well as any that could be considered promising in improving dyestuff migration. These auxiliaries were classified primarily according to their chemical constitution, and some from each class were applied.

CLASSIFICATION OF AUXILIARIES ———The classification of auxiliaries that follows is not intended to supersede any previous work on this subject. It was compiled from many sources of information and was used only to expedite and simplify the work on this paper. It is published as the guide used in our experiments.

GUIDE TO AUXILIARIES

1) SULFATED ESTERS

MAIN USES: wetting, lubricating, pasting.

Avirol AHX (German Original)
Phi-O-Sol WA (Onyx)
Nopco 1285 (Nopco)
Sandozol N (Sandoz)
Nopco 2272-R (Nopco)
Emulsifier L-43 (Wolf)
Aposol W-1345 (Wolf)
Sanfodex M (Dexter)
Trianol FW (Scholler)
Surfax WO (Houghton)
Duofol AS (Hart)
Parapon SA (Arkansas)
Dynesol ER (Amalgamated)
Tetranol (Arkansas)
Atulene (Dexter)
Ahcowet RS (Arnold-Hoffman)

2) ALKYLNAPHTHALENE SULFONATES

MAIN USES: wetting, dispersion (very stable).

Nekal BX (General)
Alkanol B (DuPont)
Arylene (Hart)
Ahcowet ANS (Arnold Hoffman)
Blancol (General)
Nopco 1187-X (Nopco)
Nopco 1067-A (Nopco)
Lomar PW (Wolf)
Napthalene Sulphonic Acid Ester (NSAE) (Onyx)
Nekal A (General)
Invadine D (Ciba)
Dexolene (Dexter)
Resolin B (Sandoz)
Invadine B (Ciba)
Tamol (Rohm & Haas)
Daxad #11 (Dewey & Almy)
Albatex WS (Ciba)
Compound #8 (DuPont)
Sorolene G Paste (Onyx)

3) ALKYL ARYL SULFONATES

MAIN USES: wetting, detergency (very stable).

Naccanol NR (National)
Santomerse D (Monsanto)
Ultrawet 30-DS (Atlantic)
Solvadine G (Ciba)
Alkanol DW, WXN (DuPont)
Hartofol (Hart)
Dynesol K-50 (Amalgamated)
Arkolene GN (Arkansas)
Cerfak 453 (Houghton)
Manganol (Dexter)
Lanitol CW (Arkansas)
Lanitol F (Arkansas)
Scour N (Scholler)
Parnol (Wolf)
Orvus Neutral Granules (P&G)
Orvus AB (P&G)
Soropon SF (General)
Regal (Armour)
Kreelon CD (Wyandotte)
Baristol 66 (Dexter)

4) SULFONATED FATTY AMIDES

MAIN USE: detergency.

Igepon T (General)
Tergenol (Hart)
Sandopan TFL (Sandoz)
Cyclopon A (General)
Allo-Sope NS (Scholler)
Mapro D Paste (Onyx)
Synthogel (Synthron)
Celopon (Arkansas)
Oratol L-48 (Wolf)
Selapon Gel (Wolf)
Eriopon 31-W (Geigy)
Igepon AP (General)

5) PROTEIN DEGRADATION PRODUCTS

MAIN USE: detergency.

Lamepon (Maywood)
Levana F (Sandoz)
Algepon (Arkansas)
Unitone XB (Scholler)
Procol C (Hart)

6) LIGNOCELLULOSE SULFITE WASTE

MAIN USE: protective colloids.

Protectol (General)
Super Spruce (W Va Paper & Pulp)
Dekol NW (General)
Marasperse (Marathon)
Cellomine Powd (Amalgamated)

7) SULFONATED ESTERS

MAIN USE: wetting.

Decerosol OT (Cyanamid)
Penetron S (Hart)
Nopco 1086-A (Nopco)
Nopco 1186-C (Nopco)
Dynesol F-20 (Amalgamated)
Insidol (Arkansas)
Nekal NS (General)
Surfax 1288 (Houghton)

8a) LONG-CHAIN ALCOHOL SULFATES

MAIN USE: detergency (high foam).

Gardinol WA (Original)
Duponol LS (DuPont)
Hartopon (Hart)
Sandopan A (Sandoz)
Sandopan PO (Sandoz)
Merpol C (DuPont)
Maprofix (Onyx)
Orvus ES (P&G)
Tergavon C (Ciba)
Orvus WA Paste (P&G)
Sellogen 0219 (Wolf)
Trisco VS (Scholler)

8b) SHORT-CHAIN ALCOHOL SULFATES

MAIN USES: wetting, penetrating.

Tergitol #7 (Carbide & Carbon)
Tergitol #4 (Carbide & Carbon)

GUIDE TO AUXILIARIES

9) NONIONICS

MAIN USES: detergency, emulsification.

(A) ETHYLENE OXIDE CONDENSATES

Igepal CA (General)
Triton X-100 (Rohm & Haas)
Cerfax 1300 (Houghton)
JH-331 (Rohm & Haas)
Levelene (Am Aniline)
Neovadine A (Ciba)
Nopco 1825 (Nopco)
Alkamine W-30 (Amalgamated)
Synthonon NF (Synthron)
Peregal O (General)
Reginol 125 (Hart)
Irgasol A (Geigy)
Evenate SX (Amalgamated)
Emulphor VN (General)
Igepal CO (General)
Nionine RK (Amalgamated)
Tergetol NPX (Carbide & Carbon)
Nopco 1525 (Nopco)
Diazopon AN (General)
Nonic 218 (Sharples)
Carbolan Salt A (Hoffman)
Neutronyx 600 (Onyx)
Emulphors (General)
Neutronyx 330 (Onyx)
Detergent L-89 (Wolf)
Trianol AL (Scholler)
Nonic 234 (Sharples)
Sterox SE (Monsanto)

(B) FATTY AKANOL AMINE CONDENSATIONS (NINOL PATENTS)

Cerfax N-100 (Houghton)
Hymolon (Hart)
Syntholate 170 (Synthron)
Syntergent K (Nopco)
Penoterge (Jordan)
Tri-A-Nol MT (Scholler)
Alkamine C-100 (Amalgamated)
Dergon OM (Arkansas)
Nonionic A-60 (P&G)
Onyxol 336 (Onyx)
Onyxol 9162 (Onyx)

10) SULFATED OILS

MAIN USES: lubricating, pasting.

Turkey red oil, caster, olive, peanut, soya (low SO_3)
Prestabil Oil (General) (high SO_3)
Supratol VF (Hart) (high SO_3)
Sandozol KB (Sandoz) (high SO_3)
Aliphatic Ester Sulphate (Onyx) (high SO_3)
Monosulph #1 (Nopco) (high SO_3)
Monopol Oil (Wolf)
Ricinole (Leatex)
Velvosheen (Onyx)
Monopole Brilliant Oil (General)
Trisulphoil XX (Scholler)
Maxitol 10 (Dexter) (high SO_3)

11) CATION-ACTIVE AGENTS

MAIN USES: leveling basic dyes, tippy-wool dyeing.

Peregal OK (General)
Triton K-60 (Rohm & Haas)
Nopco ISO (Nopco)
Nopco 1425-B (Nopco)
Catylex (Hart)
Anthromine (Arkansas)
Pixol (Am Aniline)
Peregal TW (General)
Albatex POK (Ciba)
Sapamine KW (Ciba)
Lupomin (Wolf)
Sandolan ML (Sandoz)
Softex 555 (Houghton)
Tipagon (Onyx)
Product BCO (DuPont)
Neutramine (Scholler)
Katapol VP (General)

12) SOAPS

MAIN USE: detergency.

High- and low-titer types

13) SEQUESTERING AGENTS

(A) POLYPHOSPHATES (Calgon and tripolyphosphates, etc)

(B) ETHYLDIAMINE TETRA-ACETIC ACID TYPES

Kalex (Hart)
Nullapons (General)
Varkon FP (Arkansas)
Sequestrene (Alrose, Geigy)
Versene (Bersworth)

(C) GLUCONIC ACID (Pfizer)

14) ELECTROLYTES

acids
alkalies
common salt
Glauber's salt
anhydrous sodium sulfate
urea

15) MISCELLANEOUS

(This classification covers any material which cannot be broadly classified in any other group).

Nonionic 60A (modified fatty acid amine condensate) (P&G)
Peregal ST (General)
Lyogen SF (Sandoz)
Lyogen CHF (Sandoz)
Alipal CO 433 (General)
Albatex PO (Ciba)

16) CARRIERS, SWELLING AGENTS

salicylic acid
benzoic acid
monochlorobenzene
trichlorobenzene
Chlormatic #2 (Heyden)
orthophenylphenol
paraphenylphenol
phenylmethylcarbinol (Carbide & Carbon)

According to Vickerstaff *(7)* there is no generally accepted method of testing the relative ability of dyes to level. A widely used test consists in treating a dyed piece of material with an equal weight of similar undyed material in a blank dyebath at the normal dyeing temperature and in determining the time for the two pieces to become the same shade.

In these studies all laboratory tests made use of a migration system showing the transfer of dye from an original dyed skein to an undyed skein at various times and temperatures. The times and temperatures used were consistent with normal dyehouse practice. A full dyeing was used with similar undyed material to represent gross unevenness.

Numerous methods can be used to express the measure of migration *(6, 8, 9)*. Lemin, Vickers and Vickerstaff *(10)* placed the matter on a quantitative time basis by empirically deriving an equation relating the time of half migration with the dye on the originally undyed material at any specified time. By the use of this or similar measures of rate of leveling, various investigations have been made, and the Society of Dyers and Colourists *(11)* devised methods of grouping direct, vat and wool dyes according to their leveling ability.

None of these rating methods have been used here because of the lack of simplicity of expression. The results are expressed in terms of a Transfer Index. This Index is merely a fraction, of which the numerator is the percentage of the original amount of dyestuff remaining on the originally dyed sample, and the denominator is the percentage of the original amount transferred from the originally dyed sample to the originally undyed sample. Any dyestuff which is not accounted for on the two samples must be presumed to be still in the bath or decomposed.

The percentage of the original amount of dye present on the two skeins at the end of each migration period was determined visually by comparison with dyeings of known strength. Unsuccessful systems were also reported for the sake of completeness.

The fibers chosen for experiments were nylon, Dynel acrylonitrile/vinyl-chloride copolymer, wool, Acrilan acrylic polymer, Orlon acrylic polymer, cotton, and Dacron polyester. Fibers such as acetate, which is commonly dyed with readily leveled disperse dyes, and viscose, which is quite similar to cotton in respect to the type of dyestuffs applied to it, were not investigated. Likewise, dyestuffs which level well on the individual fibers were not studied. Thus, equalizing acid colors on wool and disperse dyes on nylon were not considered.

NYLON

EXPERIMENTAL ——— Mass dyeings were made on 20/1-cotton-count nylon staple yarn by the same methods and techniques employed for dyeing on a production basis. The dyestuffs listed were dyed to a depth approximating a 2% dyeing of Alizarine Blue SAP (CI 1054) on wool.

Sufficient undyed material from the same yarn lot was withheld for the migration tests.

Milling types: Pontacyl Fast Blue 5R Conc (CI 289)
Milling Red SWB Conc 125% (CI 430)
Chrome type: Chromate Brown EBN (Pr 14)
Direct type: Pontamine Green S Extra Conc 125% (CI 583)
Acid-dyeing metalized type: Chromacyl Pink BN (Pr 326)
Neutral-dyeing metalized type: Capracyl Orange R (CI none)

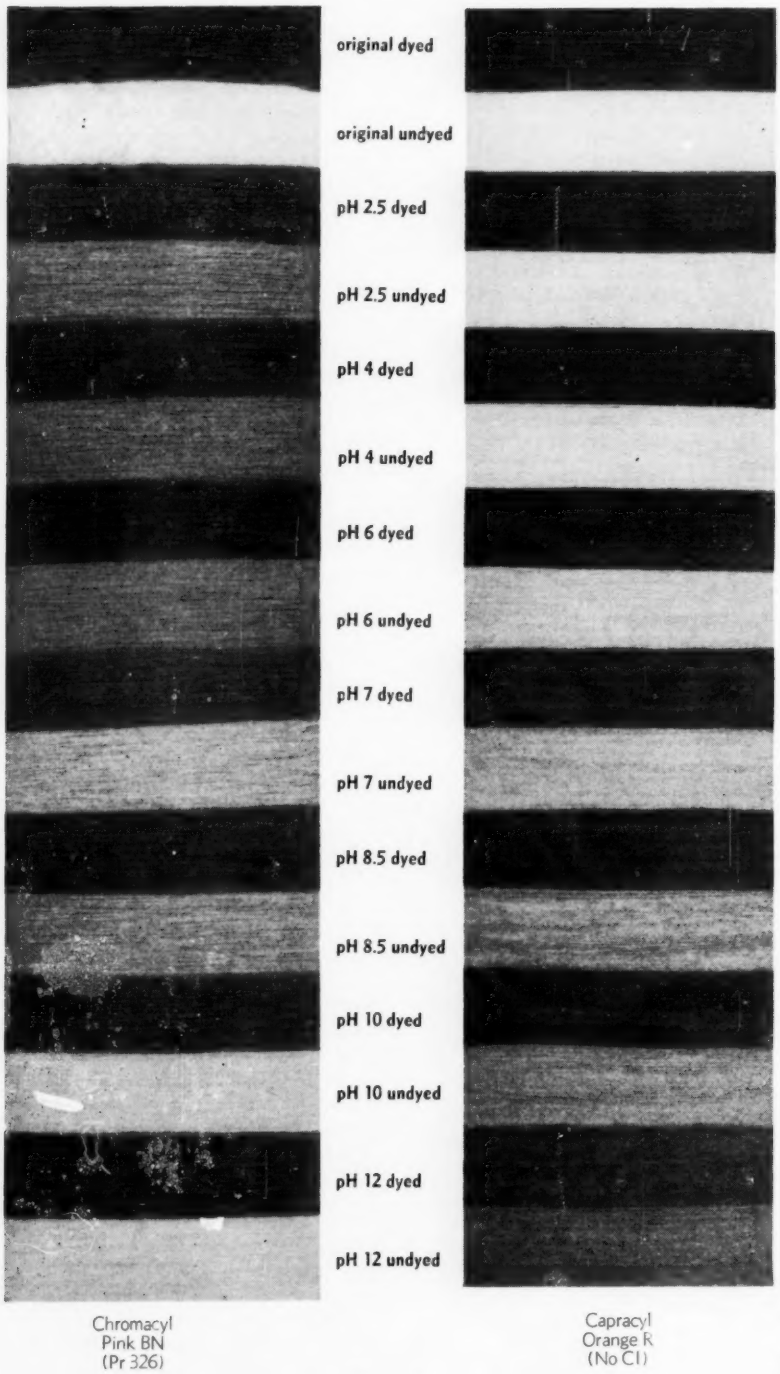


Figure 1
120-Minute Migrations with pH Variations on Nylon (210° F)

TEST PROCEDURE ——— Four 2.5-gram skeins dyed; four 2.5-gram skeins undyed; temperature, 210° F; fiber-to-liquor ratio, 1:30. Amounts of auxiliaries are expressed as percent on weight of fiber (owf). One dyed and one undyed skein and a proportionate amount of bath liquid were removed at intervals of 15, 30, 60 and 120 minutes. Migration tests were run on each classification of auxiliaries. As would be expected, more transfer occurred with the longer times. Results at 15 and 30 minutes were so much less significant than at 60 and 120 minutes that tests were run only for the latter periods.

Early in the experimental work it became apparent that the best end results, without the use of auxiliaries, could be obtained with an initial desorption period of 60 minutes by adjustment of the bath to pH 9, followed by gradual acid additions to effect reabsorption in 60 minutes. Therefore most of the tests are based on an alkaline desorption-acid reabsorption system to which has been added the auxiliary to modify the system for further improved migration.

DISCUSSION———An interesting series of pH migration tests were conducted on the strong-acid-dyeing premetalized dye, Chromacyl Pink BN (Pr 326) and a dye from the newer type of neutral-dyeing premetalized dyestuffs, Capracyl Orange R (CI none). Tests in which the pH was maintained for 120 minutes in a series from pH 2.4 to 12 indicate that Chromacyl Pink BN levels most rapidly at pH 2.5 or below, while Capracyl Orange R levels most rapidly at pH 12 or higher. (See Figure 1, also Table I, tests 46 to 59). No auxiliary was used.

It is also interesting to note that, with regard to Capracyl Orange R, the use of an electrolyte such as common salt results in poorer leveling than was obtained with water alone. This is similar to dyeing cotton with dyes that are sensitive to small quantities of salts in water, which cause a fast rate of absorption and poor migration.

Dyes reacting similarly in the migration tests were Pontamine Green S Extra Conc 125% (CI 583), Pontacyl Fast Blue 5R Conc (CI 289), and Milling Red SWB Conc 125% (CI 430). Although one color may be more difficult to level than another, the effect of pH and of the various auxiliaries is similar.

On the above dyes, best results were obtained with the use of soap and Duponol RA (Class 8A), a fatty acid dispersr, followed by acidification to not lower than pH 6.0 without any apparent breakdown of soap in the bath. Closely following this in good results was Alkamine C-100 (Class 9B), a Ninol-type auxiliary. (See Figure 2 and Graph 8). Products of these types would appear to be safer to use than soap with regard to precipitation of fatty acid upon acidification. However, care must be exercised or free fatty acid will also be released at a low pH.

The test made with Chromate Brown EBN (Pr 14) indicates that desorption of color can be accomplished with prod-

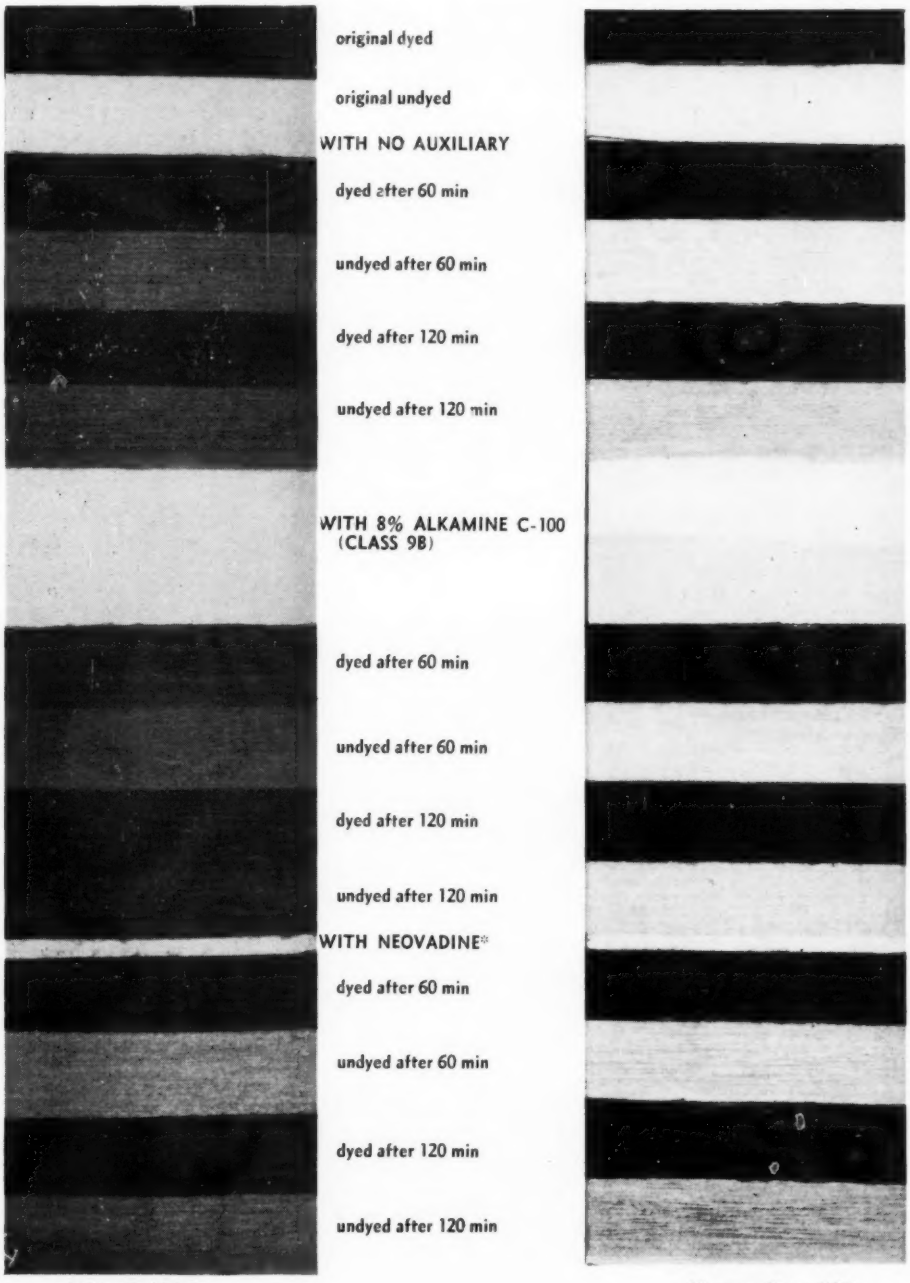


Figure 2
Migration Tests on Nylon (210°F)

* 3.0% Neovadine A (Class 9A), 3.0% oxalic acid, and 3.0% acetic acid

TABLE I
NYLON MIGRATION TESTS

Test No.	Auxiliary % owf	Class	Initial pH	Final pH	Temp, 210° F Chemical Add After 60 min % owf	Transfer Index After 60 min	Transfer Index After 120 min
	PONTACYL FAST BLUE 5R CONC (CI 289)						
1	3.5 soap	12	8.0	6.7	10 ammonium sulfate	45/30	55/45
	0.5 Duponol RA	8A					
2	8 Alkamine C	9B	8.0	6.7	10 ammonium sulfate	70/25	70/30
3	2 Carbolan Salt A	9A	7.2	5.7	10 ammonium sulfate	65/25	70/30
4	2 Nopco ISO	11	6.5	5.5	10 ammonium sulfate	80/15	80/20
5	none	—	6.7	5.5	10 ammonium sulfate	90/5	90/5
	(Tests Nos 1 & 5 shown on Graphs 2 and 1, respectively)						
	MILLING RED SWB CONC 125% (CI 430)						
6	3 Parapon SA	1	8.4	6.2	10 ammonium sulfate	50/35	55/45
7	8 Alkamine C	9B	8.8	6.4	10 ammonium sulfate	40/25	50/40
8	2 trisodium phosphate	14	8.7	6.3	10 ammonium sulfate	45/25	55/40
	0.5 Duponol RA	8A					
9	2 trisodium phosphate	14	8.5	6.2	10 ammonium sulfate	50/25	60/40
	2 Sequestrene NA,	13					
10	2 Nacconol NR	3	—	—	none	60/30	60/40
	0.25 solution mono-chlorobenzene	15					
11	2 trisodium phosphate	14	—	—	10 ammonium sulfate	55/25	55/35
	0.5 Nacconol NR	3					
12	2 trisodium phosphate	14	—	—	10 ammonium sulfate	60/15	55/35
13	2 soda ash	14	—	—	10 acetic acid	55/15	65/35
14	3 Evenate SX	9A	—	—	10 ammonium sulfate	60/25	65/35
15	40 Glauber's salt crystals	14	—	—	10 ammonium sulfate	60/25	60/30
16	4 soap	12	—	—	none	40/20	35/30
17	4 soap	12					
	1 trisodium phosphate	14			none	35/15	25/20
18	3 Neovadine A	15	—	—	none	40/15	35/20
	3 acetic acid (28%)						
19	2 Carbolan Salt A	9A	7.2	5.7	10 ammonium sulfate	65/15	70/30
20	3 Irgasol A	9A	—	—	10 ammonium sulfate	65/15	80/20
21	none	—	—	—	10 ammonium sulfate	75/10	80/20
	(Tests Nos 7 & 21 are shown on windings in Figure 2)						
	(Tests Nos 15 & 17 shown on Graphs 3 and 4, respectively)						
	CAPRACYL ORANGE R						
22	3 Duponol RA	8A	—	—	none	—	60/40
23	5 Alkanol B	2	—	—	none	70/30	60/40
24	5 Tri-A-Nol MT	9B	—	—	none	70/30	60/40
25	3 Product BCO	11	—	—	none	—	60/35
26	none	—	6.8	6.5	none	75/25	65/35
27	3 Irgasol A	9A	—	—	none	—	65/35
28	8 Nylesperse	3	—	—	none	—	65/35
29	1 Alkanol B	2	—	—	none	70/30	65/35
30	3 Compound #8	2	—	—	none	—	65/35
31	1 Tri-A-Nol MT	9B	—	—	none	70/30	65/35
32	5 Brosco-Oline	12	—	—	none	70/30	65/35
33	1 Brosco-Oline	12	—	—	none	75/25	70/30
34	5 Trisulphoil XX	10	—	—	none	75/25	70/30
35	1 Trisulphoil XX	10	—	—	none	75/25	70/30
36	2 trisodium phosphate	14	8.5	6.0	10 ammonium sulfate	70/25	70/30
	2 Sequestrene NA,	13B					

Test No.	Auxiliary % owf	Class	Initial pH	Final pH	Temp, 210° F Chemical Add After 60 min % owf	Transfer Index After 60 min	Transfer Index After 120 min
	CAPRACYL ORANGE R						
37	2 Carbolan Salt A	9A	7.2	5.4	10 ammonium sulfate	80/20	70/30
38	3 Decerosol OT	7	—	—	none	75/25	70/30
39	5 Unitone XB	5	—	—	none	75/25	70/30
40	5 Allo-Sope NS	4	—	—	none	75/25	70/30
41	5 Scour N	3	—	—	none	75/25	70/30
42	3 Tri-A-Nol FW	1	—	—	none	80/20	70/30
43	5 Trisco VS	8A	—	—	none	80/20	70/30
44	5 Neutramine	11	—	—	none	80/5	75/15
45	5 common salt	14	—	—	none	80/10	80/20
	pH Variations						
46	none		2.5	—	none	—	95/1
47	none		40.0	—	none	—	95/1
48	none		6.0	—	none	—	95/5
49	none		7.0	—	none	—	90/10
50	none		8.5	—	none	—	85/15
51	none		10.0	—	none	—	80/20
52	none		12.0	—	none	—	60/25
	(Tests Nos 26 & 45 shown on Graphs 5 and 6 respectively)						
	(Tests Nos 46 through 52 shown on windings in Figure 1)						
	CHROMACYL PINK BN (Pr 326)						
	pH Variations						
53	none		2.5	—	none	75/25	65/35
54	none		4.0	—	none	80/20	70/30
55	none		6.0	—	none	80/20	60/20
56	none		7.0	—	none	50/5	40/5
57	none		8.5	—	none	50/5	40/5
58	none		10.0	—	none	50/0	30/0
59	none		12.0	—	none	30/0	15/0
	(Tests Nos 53 through 59 incl shown on windings in Figure 1)						
60	1 Neovadine A	9A	1.6	—	none	50/35	45/35
	3 sulfuric acid						
61	1 Neovadine A	9A	2.6	—	none	60/30	55/40
	3 formic acid						
62	1 Neovadine A	9A	2.8	—	none	70/30	60/40
	3 phosphoric acid						
63	3 Neovadine A	9A	—	—	none	70/20	55/15
	3 acetic acid, 28%						
64	2 Product BCO	2	7.5	5.6	10 ammonium sulfate	40/5	55/20
65	8 Alkamine C	9B	8.8	6.3	10 ammonium sulfate	30/0	50/15
66	3 Parapon SA	1	8.5	6.3	10 ammonium sulfate	45/1	50/10
67	2 trisodium phosphate	14	8.7	6.2	10 ammonium sulfate	40/0	50/10
	0.5 Duponol RA	8A					
68	2 Nacconol NR	3	—	—	none	40/5	35/5
	0.25 solution mono-chlorobenzene	15					
69	4 soap	12	—	—	none	50/0	40/0
70	4 soap	12					
	1 trisodium poly-phosphate	13A	—	—	none	40/0	30/0

Test No.	Auxiliary % owf	Class	Initial pH	Final pH	Temp, 210° F Chemical Add After 60 min % owf	Transfer Index After 60 min	Transfer Index After 120 min
	CHROMACYL PINK BN (Pr 326)						
	Alkali Variations						
71	2 trisodium phosphate 1 Nacconol NR	14 3	—	—	none	50/0	30/0
72	4 trisodium phosphate 1 Nacconol NR	14 3	—	—	none	40/0	30/0
73	4 trisodium phosphate 1 Nacconol NR	14 3	—	—	6 formic acid	40/0	60/20
74	6 trisodium phosphate 1 Nacconol NR	14 3	—	—	none	40/0	25/0
75	8 trisodium phosphate 1 Nacconol NR	14 3	—	—	none	35/0	25/0
76	10 trisodium phosphate 1 Nacconol NR	14 3	—	—	none	30/0	20/0
	Formic Acid Variations						
77	1 Nacconol NR 2 formic acid	3	2.8	—	none	80/20	70/30
78	1 Nacconol NR 4 formic acid	3	2.5	—	none	75/25	70/30
79	1 Nacconol NR 6 formic acid	3	2.4	—	none	75/25	70/30
80	1 Nacconol NR 8 formic acid	3	2.3	—	none	75/25	70/30
81	1 Nacconol NR 10 formic acid	3	2.3	—	none	75/25	65/35
	Sulfuric Acid Variations						
82	1 Nacconol NR 2 sulfuric acid	3	1.8	—	none	75/25	65/30
83	1 Nacconol NR 4 sulfuric acid	3	1.55	—	none	75/25	65/30
84	1 Nacconol NR 6 sulfuric acid	3	1.4	—	none	70/25	65/30
85	1 Nacconol NR 8 sulfuric acid	3	1.35	—	none	65/35	60/40
86	1 Nacconol NR 10 sulfuric acid	3	1.3	—	none	65/35	60/40
	Phosphoric Acid Variations						
87	1 Nacconol NR 2 phosphoric acid	3	2.8	—	none	75/25	70/30
88	1 Nacconol NR 4 phosphoric acid	3	1.7	—	none	75/25	70/30
89	1 Nacconol NR 6 phosphoric acid	3	1.45	—	none	75/25	70/30
90	1 Nacconol NR 8 phosphoric acid	3	1.25	—	none	75/25	70/30
91	1 Nacconol NR 10 phosphoric acid	3	1.15	—	none	70/25	65/35
	PONTAMINE GREEN S EXTRA CONC 125% (CI 583)						
92	8 Alkamine C	9B	8.2	6.1	10 ammonium sulfate	70/20	75/25
93	20 trisodium phosphate 0.5 Duponol RA	14 8A	8.6	6.3	10 ammonium sulfate	70/15	75/25
	PONTAMINE GREEN S EXTRA CONC 125% (CI 583)						
94	3 Product BCO	11	—	—	none	—	75/25
95	3 Compound #8	2	—	—	none	—	75/25
96	8 Nylesperse	3	—	—	none	—	75/25
97	3 Duponol RA	8A	—	—	none	—	75/25
98	2 Product BCO	11	7.5	5.6	10 ammonium sulfate	75/20	80/20
99	2 Levelene 4 trisodium phosphate	9A 14	—	—	0.5 sulfuric acid	85/15	80/20
100	2 Neutronyx 600 4 trisodium phosphate	9A 14	—	—	0.5 sulfuric acid	85/15	80/20
101	3 Parapon SA	1	8.5	6.2	10 ammonium sulfate	85/5	90/10
102	3 Neovadine A 3 acetic acid, 28%	15	—	—	none	—	90/10
103	none	—	6.8	5.4	10 ammonium sulfate	85/5	90/10
104	2 Nekal BX	2	—	—	none	—	95/5
105	2 Sandolan TFL	4	—	—	none	—	95/5
106	2 Levelene	9A	—	—	none	—	95/5
107	2 Velvosheen	10	—	—	none	—	95/5
108	2 Sulfonated Castor Oil 50% 1 neutral soap	10 12	—	—	none	—	95/5
109	2 Triton X-100	9A	—	—	none	—	99/1
110	2 Pixol	11	—	—	none	—	99/1

(Tests Nos 92 & 103 shown on Graphs 7 and 8, respectively)

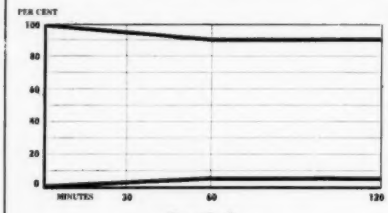
Test No.	Auxiliary % owf	Class	Initial pH	Final pH	Temp, 210° F Chemical Add After 60 min % owf	Transfer Index After 60 min	Transfer Index After 120 min
	CHROMATE BROWN EBN (Pr 14)						
*111	3 Neovadine A 3 oxalic acid	15	—	—	none	75/1	70/1
*112	3 Neovadine A 3 oxalic acid 3 acetic acid, 28%	15	—	—	none	75/1	70/1
*113	3 Neovadine A 3 oxalic acid 3 sulfuric acid	15	—	—	none	70/1	—
114	3 Neovadine A 3 sulfuric acid	15	—	—	none	95/1	—
115	3 Parapon SA	1	8.5	5.7	10 ammonium sulfate	95/1	95/1
116	2 trisodium phosphate 0.5 Duponol RA	14 8A	8.6	6.3	10 ammonium sulfate	95/1	95/1
117	3 Neovadine A	15	—	—	5 ammonium sulfate	99/1	95/1
118	8 Nylesperse	3	—	—	none	—	95/1
119	2 Sandolan TFL	4	—	—	none	—	95/1
120	2 Levelene	9A	—	—	none	—	95/1
121	3 Neovadine A 3 formic acid	15 9A	— 7.2	— 5.5	none 10 ammonium sulfate	99/1 99/1	— 99/1
122	2 Carbolan Salt A				10 ammonium sulfate	99/1	99/1
123	2 trisodium phosphate 2 Sequestrene NA2	14 8A	8.5 —	6.2 —	none	—	99/1
124	3 Duponol RA						
125	3 Product BCO	11	—	—	none	—	99/1
126	2 Velvosheen	10	—	—	none	—	99/1
127	2 Pixol	11	—	—	none	—	99/1
128	2 Sulfonated Castor Oil 50% 1 Neutral Soap	10 12	—	—	none	—	99/1
129	2 Nekal BX	2	—	—	none	—	99/1
130	3 Compound #8	2	—	—	none	—	99/1
131	3 Irgasol A	9A	—	—	none	—	99/1
132	2 Triton X-100	9A	—	—	none	—	99/1
133	8 Alkamine C	9B	8.7	6.3	10 ammonium sulfate	99/1	99/1
134	none		6.8	5.4	10 ammonium sulfate	99/1	99/1

* In tests Nos 111, 112 & 113, the shade becomes redder and brighter and will require rechroming.

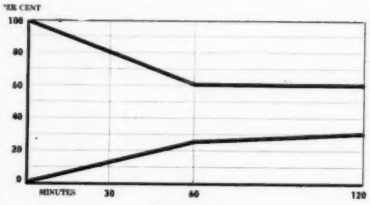
(Tests Nos 111 & 134 shown on windings in Figure 2.)

MIGRATIONS ON NYLON

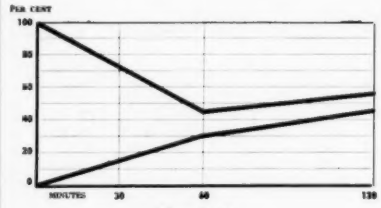
(Upper lines indicate percentages on dyed fiber; lower, on undyed)



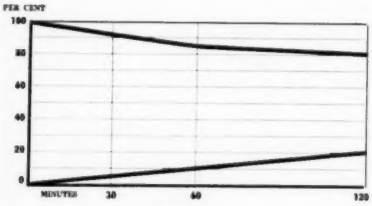
Graph 1
(See Table I, test 5)



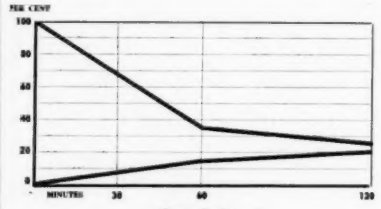
Graph 5
(See Table I, test 26)



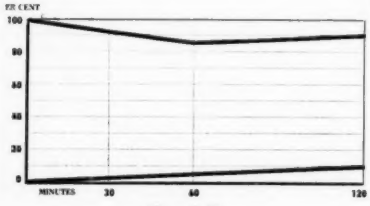
Graph 2
(See Table I, test 1)



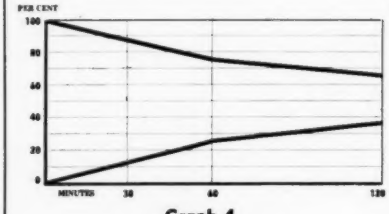
Graph 6
(See Table I, test 45)



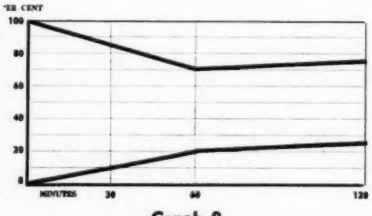
Graph 3
(See Table I, test 15)



Graph 7
(See Table I, test 103)



Graph 4
(See Table I, test 17)



Graph 8
(See Table I, test 92)

ucts such as Neovadine A (Class 9A), supplemented with acids. (See Figure 2, also Table I, test 112). However, as was found in work with other types of dyestuffs, readsorption is not possible with Neovadine A present in the bath, and it is necessary to use a fresh bath for redyeing.

Oxalic acid appeared to be the best acid used with Neovadine A. However, the chrome complex was partially broken and rechroming is necessary. This method of correcting unevenness with this color has been successfully demonstrated on an unevenly dyed mill batch.

DYNEL

EXPERIMENTAL ——— In the transfer of color from a bath to a fiber, several important considerations must be met in order that the dyeing proceed in the minimum length of time consistent with even dyeing. Some of these considerations involve the physical form of the material. In this work it was necessary to compromise the desirability of providing a large surface area and easy accessibility to the surface of the fabric with the necessity of having the samples in an easy-to-handle convenient form. Plied yarns with a knitting twist were chosen as embodying this compromise.

The dyestuffs used in this work included both a disperse (acetate) type and acid types (red, yellow, and blue). The advantages of having data on the primary colors are apparent. The individual dyestuffs were selected as being representative of the colors which would most likely be used by the practical dyer, as they possess higher than average light fastness on Dynel. To provide a uniform source of dyed Dynel, the yarn was skein-dyed in 500-gram lots. The same yarn was used for both the dyed and the undyed skeins which were subjected to the leveling tests.

TEST PROCEDURES———The leveling experiments were conducted by placing a 5-gram skein of dyed material, a 5-gram skein of undyed material, the assistant, and distilled water in a stainless-steel beaker on an electric hot plate bath ratio to fiber, 50:1; temperature, 208-210° F. The skeins were removed at the end of the specified periods.

It must be remembered that leveling an unevenly dyed material involves both an "undyeing" from the heavy portions and a "dyeing" of the lighter portions. For this reason, leveling Dynel will be best accomplished if done at or very near the boil.

Maximum desorption and minimum reabsorption of acid dyes occurred in a bath of high pH. In order to secure readsorption, sulfuric acid was used to lower the pH of the bath to 4. In some cases 0.6% anhydrous cupric sulfate and 0.3% Sulfoxite S were dissolved separately in cold water; the two solutions were mixed and slowly dripped from a buret into the boiling bath. The result was an increased absorption of color, which could be attributed directly to the addition of cuprous ion.

DISCUSSION ——— The leveling of unevenly dyed Dynel is in several ways similar to the dyeing of Dynel. In each case the temperature of the operation must be above 205° F. Leveling, like dyeing, of disperse (acetate) dye on Dynel is more easily and simply accomplished than the leveling and dyeing of acid colors on Dynel. Examples of a disperse (acetate) dye on Dynel are given in Table II. Leveling of disperse (acetate) dyes on Dynel usually may be accomplished by further boiling the material with only those assistants originally put into the bath for dyeing. In some cases, the addition of ammonia will speed leveling. Although higher amounts of dyeing assistants and wetting agents will desorb more dye, they also prevent the readsorption of that dye. The use of 5% adjusted Calgon (Class 13A), with 3% ammonium hydroxide

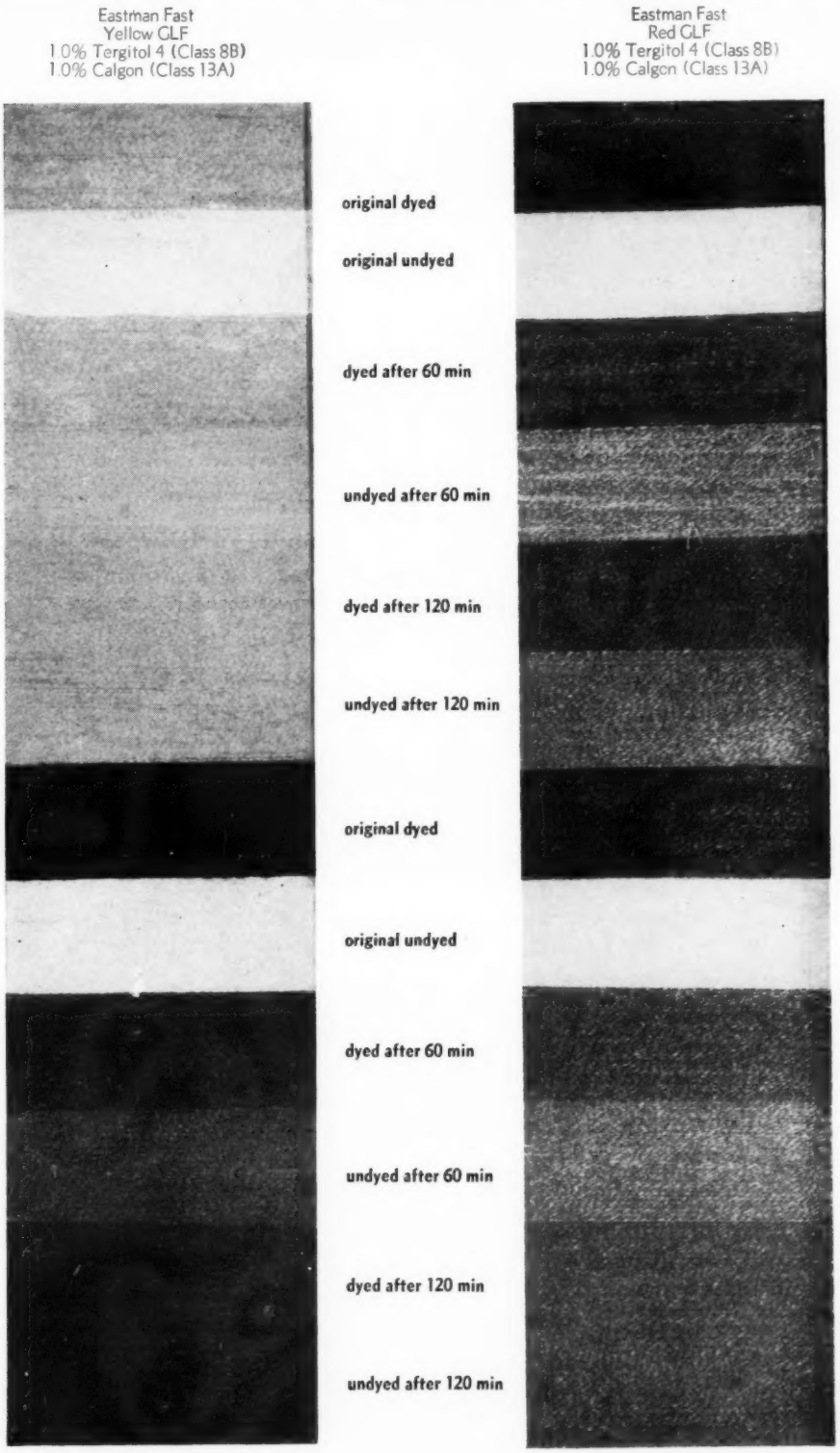


Figure 3
Migration Tests on Dynel (212°F)

TABLE II

MIGRATION OF ACID DYES ON DYNEL

Test No.	Auxiliary % owf	Class	Bath pH	Transfer Index After 30 min	60 min	120 min
	Dyestuff: 2.0% Anthraquinone Blue SWF (Pr 12) owf. *Dyeing Method:* Reduced copper.					
1	distilled water	—	7	87/12	82/17	70/30
2	3 Sandopan TFL	4	6	90/10	80/20	70/30
3	3 Peregal OK	11	6	81/17	76/21	70/27
4	3 Levelene	9A	6	85/15	80/17	70/25
5	3 Sandozol KB	10	6	80/15	80/15	75/25
6	3 Victawet 12	none	6	86/13	82/18	75/25
7	3 Tergitol P-28	none	6	86/14	83/17	75/25
8	3 Tergitol 7	8B	6	87/12	85/15	75/25
9	3 Sandozol N	1	6	90/10	80/20	75/25
10	3 Blancol	2	6	87/12	82/17	75/25
11	3 Ucon H-6	9A	6	86/14	83/17	77/22
12	3 Deceresol OT	7	6	80/5	70/12	60/17
13	3 Duponol LS	8A	6	70/10	70/12	60/18
14	3 Levana F	5	6	87/12	85/15	80/20
15	3 Macconol NR	3	6	90/10	80/10	80/20
16	2 Olate Flakes 12					
	2 ammonium hydroxide	14	6	40/1	27/1	25/15
17	3 Olate Flakes	12	6	65/1	50/2	45/10
18	3 Cerfak N-100	9B	6	72/5	40/12	—
19	3 Calgon	13A	6	70/6	50/10	40/15
20	3 Versene	13B	6	67/5	47/7	35/9
21	3 Versene Fe-3	13B	6	80/1	70/2	50/11
22	3 Neovadine A	15	6	85/12	70/15	—
23	10 Neovadine A	15	6	80/10	70/15	—
	Dyestuff: 2% Anthraquinone Blue SWF (Pr 12) owf. *Dyeing Method:* 0.6% reduced copper and 2.0% p-phenylphenol.					
24	3 Peregal OK	11	6	80/10	65/20	58/30
25	3 Sandolan ML	11	6	70/10	—	52/25
26	3 Sandopan TN	15	6	60/5	—	55/25
27	3 Protectol	6	6	80/5	—	55/25
28	3 Ekaline F	9A	6	60/3	—	52/22
29	2 Purasist RA	16	4	60/10	—	50/20
30	sulfuric acid	14	6	80/5	—	60/22
31	3 Sandozol N	1	6	80/5	70/10	60/20
32	3 Blancol	2	6	82/9	70/10	60/20
33	3 Sandopan TFL	4	6	80/5	70/10	60/20
34	3 Levelene	9A	6	82/10	72/15	65/20
35	3 Sandozol KB	10	6	80/9	72/15	65/20
36	sulfuric acid	14	2	80/3	—	60/15
37	sulfuric acid	14	4	85/10	—	70/25
38	sodium hydroxide	14	8	80/1	—	55/5
39	sodium hydroxide	14	10	70/1	—	55/5
40	distilled water	none	7	80/3	—	60/7
41	sodium hydroxide	14	12	65/1	—	50/2
42	3 Calgon	13A	7	—	—	37/5
43	3 Versene	13B	8	—	—	37/2
44	3 soap 12					
	3 ammonium hydroxide	14	8	—	—	20/2
45	3 soap	12	7	—	—	32/1
	Dyestuff: 2.0% Cloth Red G (CI 249) owf. *Dyeing Method:* Reduced copper.					
46	3 Protectol	6	6	80/5	—	70/17
47	sulfuric acid	14	2	90/9	—	85/10
48	sulfuric acid	14	4	90/10	—	85/10
49	sulfuric acid	14	6	95/5	—	90/10
50	distilled water	—	7	95/1	—	90/10
51	3 Calgon	13A	7	—	—	55/7
52	3 Sandozol KB	10	6	97/2	94/4	87/7
53	3 Levelene	9A	6	97/1	94/4	90/5
54	3 Blancol	2	6	97/2	92/3	87/5
55	3 Sandozol N	1	6	99/1	97/2	90/7
56	3 Sandopan TFL	4	6	97/1	92/4	87/6
57	3 Peregal OK	11	6	97/2	94/5	89/6
58	3 soap 12					
	3 ammonium hydroxide	14	8	—	—	30/2
59	3 Versene	13B	8	—	—	40/1
60	3 soap	12	7	—	—	45/4
61	sodium hydroxide	14	8	85/1	—	60/1
62	sodium hydroxide	14	10	67/0	—	50/1
63	sodium hydroxide	14	12	80/0	—	40/1
	Dyestuff: 2% Cloth Red G (CI 249) owf. *Dyeing Method:* 0.6% reduced copper and 2.0% p-phenylphenol.					
64	sulfuric acid	14	2	90/5	—	65/15
65	sulfuric acid	14	4	85/8	—	70/15
66	sulfuric acid	14	6	85/7	—	80/15
67	distilled water	—	7	75/2	—	75/7
68	sodium hydroxide	14	8	82/2	—	65/5
69	sodium hydroxide	14	10	82/0	—	55/1
70	sodium hydroxide	14	12	80/0	—	55/1
71	3 Sandozol N	1	6	98/1	95/4	82/15
72	3 Blancol	2	6	95/3	90/5	85/9
73	3 Sandopan TFL	4	6	97/2	92/8	87/10
74	3 Protectol	6	6	87/7	—	70/12
75	3 Levelene	9A	6	95/5	90/9	87/10
76	3 Sandozol KB	10	6	98/1	95/5	84/15
77	3 Peregal OK	11	6	95/4	95/4	85/12
78	3 Calgon	13A	7	—	—	50/5
79	3 Versene	13B	8	—	—	40/1
80	3 soap 12					
	3 ammonium hydroxide	14	8	—	—	30/2
81	3 soap	12	7	—	—	45/4
	Dyestuff: 2.0% Sulfonine Yellow 2G (CI 642) owf. *Dyeing Method:* Reduced copper.					
82	distilled water	—	7	—	—	80/20
83	3 Sandozol N	1	6	97/2	95/5	90/10
84	3 Blancol	2	6	98/2	90/10	88/12
85	3 Sandopan TFL	4	6	96/3	93/6	90/10
86	3 Levelene	9A	6	97/2	96/4	86/13
87	3 Sandozol KB	10	6	97/2	95/5	87/12
88	3 Peregal OK	11	6	96/3	92/7	87/12
89	3 Calgon	13A	7	—	—	45/2
90	3 Versene	13B	8	—	—	50/0
91	3 soap 12					
	3 ammonium hydroxide	14	8	—	—	60/0
92	3 soap	12	7	—	—	50/0

TABLE II—(Cont'd)

MIGRATION OF ACID DYES ON DYNEL

Test No.	Auxiliary % owf	Class	Bath pH	Transfer Index After 30 min	60 min	120 min
	Dyestuff: 2% Cloth Red G (CI 249) owf. *Dyeing Method:* 0.6% reduced copper and 2.0% p-phenylphenol.					
93	sulfuric acid	14	2	90/5	—	65/15
94	sulfuric acid	14	4	85/8	—	70/15
95	sulfuric acid	14	6	85/7	—	80/15
96	distilled water	—	7	75/2	—	75/7
97	sodium hydroxide	14	8	82/2	—	65/5
98	sodium hydroxide	14	10	82/0	—	55/1
99	sodium hydroxide	14	12	80/0	—	55/1
100	3 Sandozol N	1	6	98/1	95/4	82/15
101	3 Blancol	2	6	95/3	90/5	85/9
102	3 Sandopan TFL	4	6	97/2	92/8	87/10
103	3 Protectol	6	6	87/7	—	70/12
104	3 Levelene	9A	6	95/5	90/9	87/10
105	3 Sandozol KB	10	6	98/1	95/5	84/15
106	3 Peregal OK	11	6	95/4	95/4	85/12
107	3 Calgon	13A	7	—	—	50/5
108	3 Versene	13B	8	—	—	40/1
109	3 soap 12					
	3 ammonium hydroxide	14	8	—	—	30/2
110	3 soap	12	7	—	—	45/4
	Dyestuff: 2.0% Sulfonine Yellow 2G (CI 642) owf. *Dyeing Method:* Reduced copper.					
111	distilled water	—	7	—	—	80/20
112	3 Sandozol N	1	6	97/2	95/5	90/10
113	3 Blancol	2	6	98/2	90/10	88/12
114	3 Sandopan TFL	4	6	96/3	93/6	90/10
115	3 Levelene	9A	6	97/2	96/4	86/13
116	3 Sandozol KB	10	6	97/2	95/5	87/12
117	3 Peregal OK	11	6	96/3	92/7	87/12
118	3 Calgon	13A	7	—	—	45/2
119	3 Versene	13B	8	—	—	50/0
120	3 soap 12					
	3 ammonium hydroxide	14	8	—	—	60/0
121	3 soap	12	7	—	—	50/0

TABLE II—(Cont'd)

MIGRATION OF ACETATE DYES ON DYNEL

Test No.	Assistant % owf	Class	Bath pH	Transfer Index After Mins 30	60	120
	Dyestuff: 2.0% Celliton Fast Blue FFR (CI 1) owf. *Dyeing Method:* Reduced copper.					
122	distilled water	—	7	90/10	85/15	80/20
123	3 Sandopan TFL	4	6	95/5	90/10	85/15
124	3 Peregal OK	11	6	90/10	85/15	80/20
125	3 Levelene	9A	6	90/10	85/15	80/20
126	3 Sandozol KB	10	6	90/10	85/15	80/20
127	3 Victawet 12	none	6	90/10	85/15	80/20
128	3 Tergitol P-28	none	6	90/10	85/15	80/20
129	3 Tergitol 7	8B	6	90/10	85/15	80/20
130	3 Sandozol N	1	6	95/5	90/10	85/15
131	3 Blancol	2	6	90/10	85/15	80/20
132	3 Ucon H-6	9A	6	90/10	85/15	80/20
133	3 Deceresol OT	7	6	85/10	80/15	75/20
134	3 Duponol LS	8A	6	85/10	80/15	75/20
135	3 Levana F	5	6	90/10	85/15	80/20
136	3 Macconol NR	3	6	90/10	85/15	80/20
137	2 Olate Flakes 12					
	2 ammonium hydroxide	14	6	80/5	75/10	70/15
138	3 Olate Flakes	12	6	85/5	80/10	75/15
139	3 Cerfak N-100	9B	6	85/5	80/10	75/15
140	3 Calgon	13A	6	85/5	80/10	75/15
141	3 Versene	13B	6	85/5	80/10	75/15
142	3 Versene Fe-3	13B	6	85/5	80/10	75/15
143	3 Neovadine A	15	6	85/5	80/10	75/15
144	10 Neovadine A	15	6	85/5	80/10	75/15
	Dyestuff: 2% Celliton Fast Blue FFR (CI 1) owf. *Dyeing Method:* 0.6% reduced copper and 2.0% p-phenylphenol.					
145	3 Peregal OK	11	6	90/10	85/15	80/20
146	3 Sandolan ML	11	6	90/10	85/15	80/20
147	3 Sandopan TN	15	6	90/10	85/15	80/20
148	3 Protectol	6	6	90/10	85/15	80/20
149	3 Ekaline F	9A	6	90/10	85/15	80/20
150	2 Purasist RA	16	4	90/10	85/15	80/20
151	sulfuric acid	14	6	90/10	85/15	80/20
152	3 Sandozol N	1	6	95/5	90/10	85/15
153	3 Blancol	2	6	90/10	85/15	80/20
154	3 Sandopan TFL	4	6	90/10	85/15	80/20
155	3 Levelene	9A	6	90/10	85/15	80/20
156	3 Sandozol KB	10	6	90/10	85/15	80/20
157	sulfuric acid	14	2	90/10	85/15	80/20
158	sulfuric acid	14	4	90/10	85/15	80/20
159	sodium hydroxide	14	8	90/10	85/15	80/20
160	sodium hydroxide	14	10	90/10	85/15	80/20
161	distilled water	none	7	90/10	85/15	80/20
162	sodium hydroxide	14	12	90/10	85/15	80/20
163	3 Calgon	13A	7	90/10	85/15	80/20
164	3 Versene	13B	8	90/10	85/15	80/20
165	3 soap 12					
	3 ammonium hydroxide	14	8	90/10	85/15	80/20
166	3 soap	12	7	90/10	85/15	80/20

43	3 Versene	13B	8	—	—	37/2
44	3 soap 3 ammonium hydroxide	12 14	8	—	—	20/2
45	3 soap	12	7	—	—	32/1
89	3 Calgon	13A	7	—	—	45/2
90	3 Versene	13B	8	—	—	50/0
91	3 soap 3 ammonium hydroxide	12 14	8	—	—	60/0
92	3 soap	12	7	—	—	50/0

TABLE II—(Cont'd)
MIGRATION OF ACID DYES ON DYNEL

Dyeing Method: Reduced copper and p-phenylphenol.

Test No.	Dyestuff % owf	Assistant % owf	After min	pH	Transfer Index
93	2 Anthraquinone Blue SWF (Pr 12)	ammonium hydroxide	30	10	20/1
		sulfuric acid	60	6	35/30
		ammonium hydroxide	90	10	20/10
		sulfuric acid	120	6	35/40
94	2 Cloth Red G (CI 249)	ammonium hydroxide	30	10	40/0
		sulfuric acid	60	2	50/10
		ammonium hydroxide	90	10	30/5
		sulfuric acid	120	2	60/20
95	2 Cloth Red G (CI 249)	ammonium hydroxide	30	10	25/0
		sulfuric acid	60	6	50/15
		ammonium hydroxide	90	10	30/1
		sulfuric acid	120	6	40/20
96	2 Cloth Red G (CI 249)	3 Protectol, Class 6—ammonium hydroxide	30	10	50/1
		sulfuric acid	60	6	40/10
		ammonium hydroxide	90	10	30/1
		sulfuric acid	120	6	60/17
97	2 Cloth Red G (CI 249)	3 Peregal OK, Class 11, ammonium hydroxide	30	10	60/1
		sulfuric acid	60	6	50/10
		ammonium hydroxide	90	10	40/5
		sulfuric acid	120	6	70/22
98	2 Anthraquinone Blue SWF (Pr 12)	sodium hydroxide and p-phenylphenol, Class 16	30	10	57/1
		sulfuric acid	60	4	58/15
		sulfuric acid	120	4	56/25

TABLE II—(Cont'd)
MIGRATION OF ACETATE DYES ON DYNEL

Test No.	Assistant % owf	Class	Bath pH	Transfer Index After Mins 30	60	120	240
		A) 3.0% Acetate Fast Yellow GLF					
103	distilled water	—	7	60/15	50/30	40/40	—
104	1 Tergitol 4 1 Calgon	8B 13A	7	80/15	40/20	40/40	—
		B) 1.5% Eastone Fast Red GLF					
105	distilled water	—	7	83/17	73/27	60/40	—
106	1 Tergitol 4 1 Calgon	8B 13A	7	83/17	73/27	60/40	—
107	1 Peregal OK	11	7	67/13	67/20	60/27	—
108	1 Sodium Carbonate	14	10	73/20	60/20	47/33	—
109	5 Tergitol 7	8B	7	67/23	—	67/33	—
110	5 sodium carbonate	14	10.5	—	—	47/27	—
111	3 ammonium hydroxide 5 Calgon	14 13A	8.5	—	42/27	—	33/33
		C) 1.5% Eastman Fast Blue GLF					
112	distilled water	—	7	87/10	80/13	80/40	—
113	1 Tergitol 4 1 Calgon	8B 13A	7	87/10	80/13	80/40	—
114	5 Tergitol 7	8B	7	87/10	—	73/27	—
115	5 sodium carbonate	14	10.5	—	—	27/15	—
116	3 ammonium hydroxide 5 Calgon	14 13A	8.5	—	45/20	—	45/40
117	3 ammonium hydroxide	14	8.5	—	—	53/20	—

Dyestuff: 2% Anthraquinone Blue SWF (Pr 12).
Dyeing Method: Reduced Copper.
Leveling Procedures: Sixty minutes boil with named auxiliary, bath pH adjusted to 4, reduced copper added, bath held at the boil for an additional sixty minutes.

Test No.	Dyestuff % owf	Assistant % owf	Class	Desorption Period, min	Readsorption Period, min	Sulfuric Acid Used To Cause Readsorption	Transfer Index End of Desorption	Transfer Index End of Readsorption
99	2 Anthraquinone Blue SWF (Pr 12) dyed using 0.6% reduced copper	2 NH_4OH	14	60	60	Reduced Copper, pH4	35/15	65/32
		3 Cerlak N-100	9B	60	60	Reduced Copper, pH4	40/12	67/32
		3 Neovadine A	15	60	60	Reduced Copper, pH4	70/15	60/30
		10 Neovadine A	15	60	60	Reduced Copper, pH4	70/15	50/20
100	2 Anthraquinone Blue SWF (Pr 12) dyed using 0.6% reduced copper	3 Calgon	13A	120	30	Reduced Copper, pH4	37/5	55/35
		3 Calgon	13A	120	30	Reduced Copper, pH4	37/5	40/25
	plus 2% p-phenylphenol	6 NH_4OH	14	120	30	Reduced Copper, pH4		45/35
101	2 Cloth Red G (CI 249) dyed using 0.6% reduced copper	3 Calgon	13A	120	30	Reduced Copper, pH4	55/7	60/20
		3 Calgon	13A	120	30	Reduced Copper, pH4	55/7	55/15
		6 NH_4OH	14	120	30	Reduced Copper, pH4		55/15
102	2 Cloth Red G (CI 249) dyed using 0.6% reduced copper	3 Calgon	13A	120	30	Reduced Copper, pH4	50/5	70/25
		3 Calgon	13A	120	30	Reduced Copper, pH4	50/5	65/17
	plus 2% p-phenylphenol	6 NH_4OH	14	120	30	Reduced Copper, pH4		70/25
102A	2 Sulfonine Yellow 2G (CI 642) dyed using 0.6% reduced copper	3 Calgon	13A	120	30	Reduced Copper, pH4	45/2	70/25
		3 Calgon	13A	120	30	Reduced Copper, pH4	45/2	60/12
		6 NH_4OH	14	120	30	Reduced Copper, pH4		60/25

gave the best results with disperse (acetate) dyes. In addition to good migration, desorption of dye was low, 33% dye in the bath.

The same considerations of temperature and concentration of wetting agents mentioned above for disperse dyes apply to acid colors. Acid dyes on Dynel are difficult to level. Migration systems similar to those used with disperse dyes produced poor results. The best system was Peregal OK (Class 11). (See Graph 9). Extreme pH values of pH 2 (sulfuric acid) and pH 12 (sodium hydroxide) gave poor results.

It will be noted in Table II (Migration of Acid Dyes on Dynel) that Classes 12, 13 and 14 were the only products tested which desorbed enough color to enable

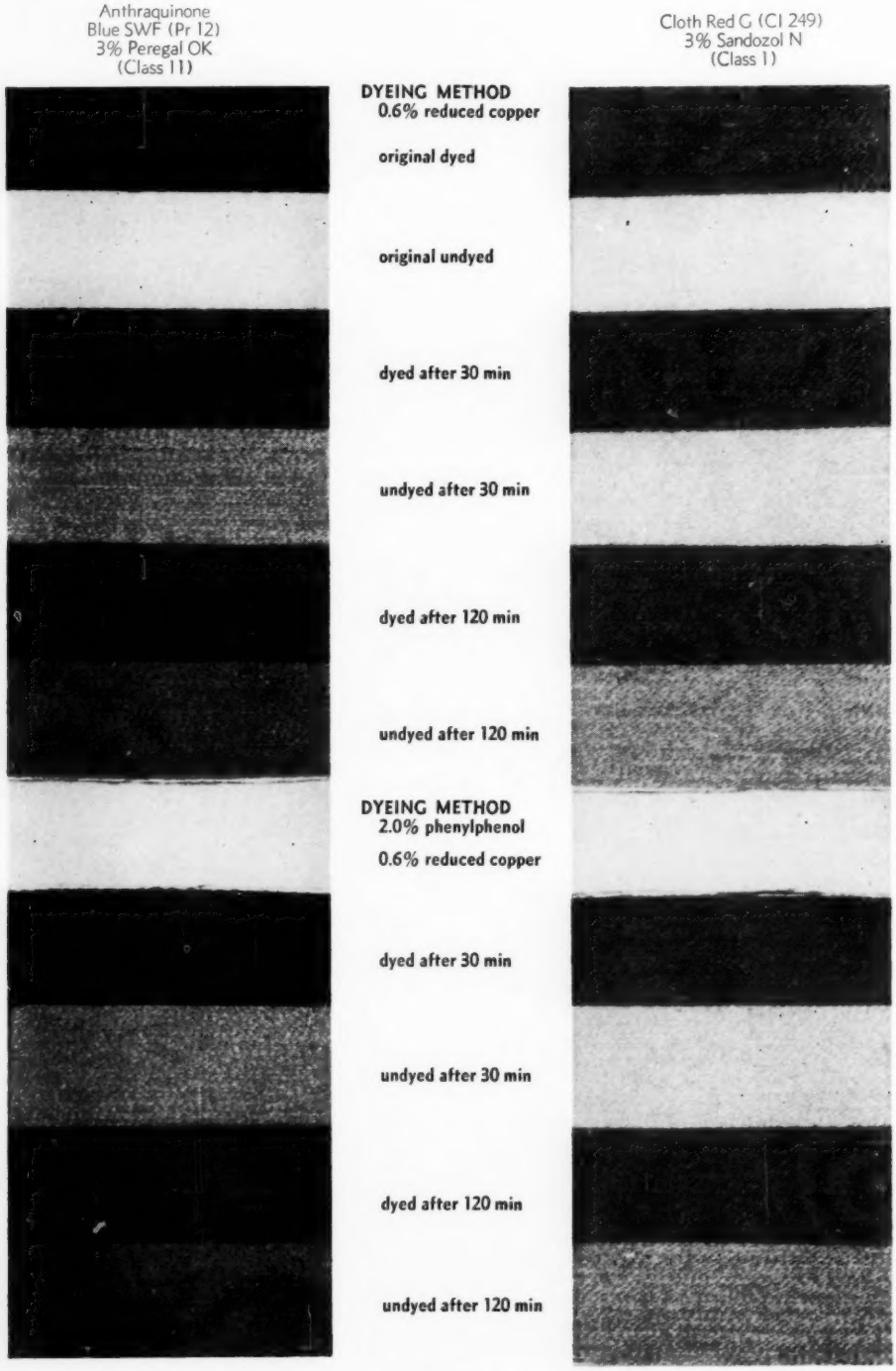
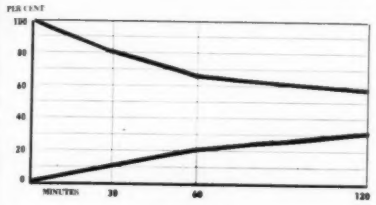

Anthraquinone Blue SWF (Pr 12) 3% Peregal OK (Class 11)
Cloth Red G (CI 249) 3% Sandozol N (Class 1)
DYEING METHOD 0.6% reduced copper
original dyed
original undyed
dyed after 30 min
undyed after 30 min
dyed after 120 min
undyed after 120 min
DYEING METHOD 2.0% phenylphenol 0.6% reduced copper
dyed after 30 min
undyed after 30 min
dyed after 120 min
undyed after 120 min

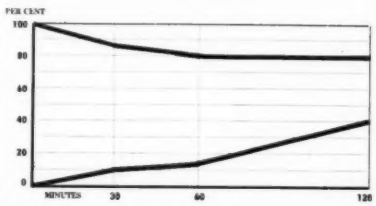
Figure 4
Migration Tests on Dynel

MIGRATIONS ON DYNEL

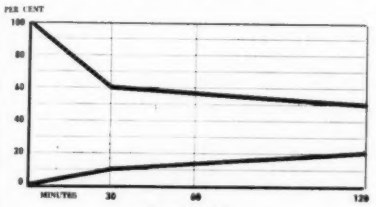
(Upper lines indicate percentages on dyed fiber; lower lines, undyed)



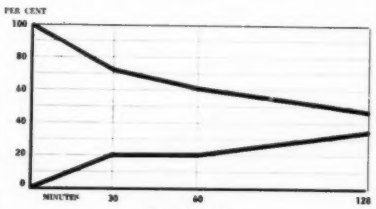
Graph 9
(See Table II, test 24)



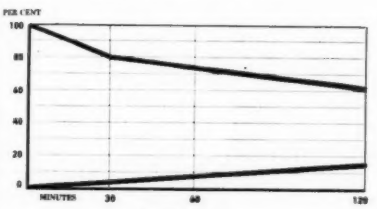
Graph 13
(See Table II, test 113)



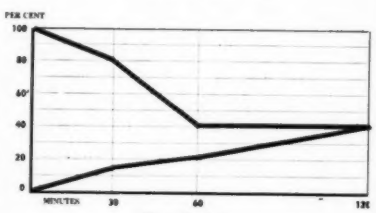
Graph 10
(See Table II, test 102)



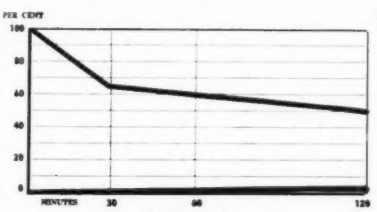
Graph 14
(See Table II, test 108)



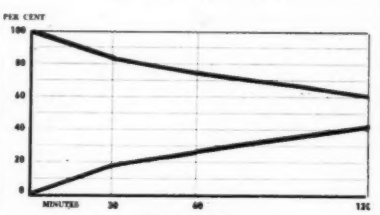
Graph 11
(See Table II, test 36)



Graph 15
(See Table II, test 104)



Graph 12
(See Table II, test 41)



Graph 16
(See Table II, test 106)

the reabsorption process to produce reasonably good results. The most desorption from the dyed material and least reabsorption in the undyed material occurred in baths of a pH value greater than 7.

Best desorption was obtained with 3.0% soap (Class 12) and 3.0% ammonium hydroxide. (See Table II, test 44). However, the pH of the bath cannot be reduced to pH 4 without precipitation of the soap. Calgon (Class 13A), Versene (Class 13B) and ammonium hydroxide were also very effective as desorbing agents. Both Versene and ammonium hydroxide caused dulling of the dyes, whereas the shade was unaffected by Calgon.

As noted previously, a desorption-reabsorption procedure with reduced copper added after readjustment of the pH to 4 with sulfuric acid gave best results. In addition, each of the acid dyes investigated was applied to the material with 1) reduced copper assistant and 2) reduced copper and p-phenylphenol. Tests using the desorption-readsorption with reduced copper system showed in all cases slightly better migration when the material had been originally dyed with both copper and p-phenylphenol.

WOOL

EXPERIMENTAL——The ease with which an unlevel dyeing on wool may be corrected without resorting to damaging reduction or oxidation stripping treatments varies greatly among the general classes of wool dyes.

Unfortunately, the wool dyer is faced with the fact that, generally, the dyes with the most desirable all-round fastness properties are the most difficult to apply evenly during dyeing, and also most difficult to make level once on the wool unevenly. The milling acid, the new neutral-dyeing premetalized, and the Chrome dyes (particularly once chroming has been completed) are the classes of dyes which present this difficulty. Equalizing acid dyes and strong-acid-dyeing metalized dyes when on wool unevenly, can be leveled by additional boiling time.

Included as auxiliaries are the conventional wool dyeing assistants, such as salts and acids. Special emphasis is given those materials to show their importance in obtaining nearly optimum dyebath conditions for good migration.

PREPARATION OF MATERIAL——One hundred pounds of a two-ply worsted yarn, 50's grade wool was set aside to assure a constant source of wool. Fifty pounds of this yarn was scoured in a Hussong dyeing machine with Triton X-100 and tetrasodium pyrophosphate. The scoured yarn had a 0.6% carbon-tetrachloride extractable and a pH in equilibrium with water of 6.8. One-half of this scoured lot was dyed in a Hussong machine with 4.0% of Polar Brilliant Blue RAW 110%, started in a dyebath containing ammonium sulfate and exhausted with acetic acid. The pH of an aqueous extract of this dyed lot was 4.5. The other half of the scoured yarn was set aside for use as the white yarn in the migration tests. Polar Brilliant Blue RAW 110% was chosen for the bulk of the auxiliary on migration work, as it is known as a moderate to poor migrating dye. It is representative of a large group of milling acid dyes, intermediate in migrating properties between the good migrating equalizing acid dyes and the very poor migrating chrome dyes (after chromation). If no considerable improvement in migration could be brought about by auxiliaries on this dye, there should be no hope for benefiting chrome-dye migration.

Smaller lots of the same prescoured yarn were dyed with the following dyes:

2% Alizarol Brown EB (Pr 14) top-chrome
4% Cibalon Brown BL (CI none)
1.5% Alizarine Sapphire BS 150% (CI 1054)

These dyeings were used to test the effect of those auxiliaries that increased the migration of Polar Brilliant Blue RAW 110%. The chrome dye after chromation was used in these tests as that is the condition in which unevenness is discovered and must be corrected.

WOOL TEST PROCEDURE———The procedure followed for the bulk of the tests was as follows:

Three 500-ml blank baths were prepared for each set of testing conditions. A set of 5-gram skeins, each set consisting of one dyed and one undyed, was prepared for each bath. The three baths containing 10% of the auxiliary on the weight of the two skeins and adjusted with acid or alkali additions to give the desired pH level during the migration were brought to the boil. A 1:50 wool: liquor ratio was maintained approximately constant during the tests by regular additions of water. Distilled water was used in all work.

The rather high percentage of auxiliary used in these tests, 10%, was selected purposely to avoid the possibility of too little of any material being used.

One set of skeins was placed in each boiling bath. The first bath was boiled for one hour; the second, for two hours; and the third was boiled for one hour, followed by a chemical addition, invariably acid, to bring about readsorption of described dye; and boiling was continued for one hour. At the end of each treatment, the skeins were removed, squeezed to release dye liquor, and the dyebaths were brought back to original volume.

In addition to the visual evaluation of dye on the skeins after cooling, each bath was checked for amount of dye. These estimates were made either spectrophotometrically or visually against a series of dilutions of the dye bath used to obtain the dyeing under test. These values were used to check the standard skein evaluations. The total of the three estimated values, dye in bath and on each of the two skeins, should be 100%. Much greater success was had using the spectrophotometric evaluations than with the visual.

In a few cases with the visual estimation of the dye left in the bath, a total as low as 80% was obtained. It was found, upon checking with spectrophotometric readings, that the transmittance properties of some of these baths were increased, indicating agglomeration of dye. The spectrophotometer could be set to compensate for these changes; the visual procedure could not.

pH Level: Preliminary tests were made on the dyeing of Polar Brilliant Blue RAW 110% to determine the pH level at which the dyebaths should be controlled to realize optimum migration. A number of baths containing distilled water were adjusted to cover a pH range of approximately 3.0 to 8.8. A set of dyed and blank skeins was placed in each bath at the boil. The bath was boiled 10 minutes, checked for pH, adjusted further to maintain the desired pH, and continued at the boil for the total time of 60 minutes.

The results of these tests are illustrated in Figure 5 on the graph; the top curve shows the percent dye remaining on the original skein; the bottom curve the dye absorbed by the blank skein over the range of pH studied. It is noteworthy that above pH 5.8 the desorption of the dye becomes increasingly greater, i e, the total percent dye on the two skeins becomes decreasingly less than 100%. Below pH 5.8 th total perecent dye on the two skeins is almost constant at 100%. In this range the difference between 100% and the actual total is accounted for by slight desorption and experimental error.

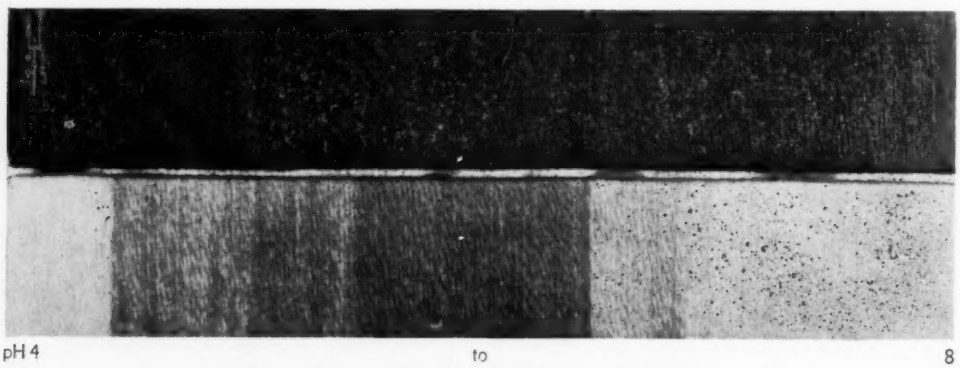
Another point of importance shown by these curves is high degree of dye reabsorption by the blank skein in the pH range 5.7. A pH of 6.0 was selected as the optimum dyebath condition for the comparison of the auxiliaries. The hazard of fiber damage at the higher pH's and the desirability of having the optimum migration tendency shown by the dye at pH 6.0 led to this decision. Also this pH is approximately that found in dyers' experiences to lead to the most level application of this dye.

Logically for the other dyes used in this study, the optimum pH to use for the leveling tests are not necessarily the same. For these dyes a pH level was used approximating that which is maintained in the recommended application for each dye. Figure 5 also gives a visual picture of this variation of migration of the Polar Brilliant Blue RAW 110% dyeing at different pH levels.

DISCUSSION———In Table III-A are listed the results of migration tests on each auxilary product. For the majority of auxiliaries, it was found that 1% acetic acid (56%) owf was the correct amount to reach pH 5.2, at which level dyebath exhaustion was complete if readsorption could be accomplished. A control showing the leveling ability of Polar Brilliant Blue RAW 110% in distilled water at pH 6.0 is included in Table III-A to provide a basis for judgment of the effect of the various auxiliaries tested.

Class 11 auxiliaries, particularly Nopco 1425-B, gave the best average leveling performance. The tests illustrated in Figure 6 were conducted at pH 6 and show considerable increase of migration over the control of the no-Auxiliary tets at the same pH value.

Migration tests were conducted with Nopco 1425-B (Class 11) at a pH ad-



Effect of pH on leveling Polar Brilliant Blue RAW on wool
1 hr at boil—no assistant

justed at 3.0 with 1% formic acid. In comparison, the same conditions were run without auxiliary. At such low pH value as 3.0 without the dyed skein, the Transfer Index is practically 100/0, whereas, modifying the bath with the addition of Nopco 1425-B (Class 11) promotes migration to a Transfer Index figure of 27/21.

All the products of this class brought the dye content of the two skeins of each test set close together. However, these cation-active auxiliaries can be suspected of having a tendency to precipitate dyes. Fortunately, Nopco 1425-B, Sandolan ML, and Peregal OK are rather weak in their ionic action, in fact, are claimed to be nonionic in acid solution, and do not

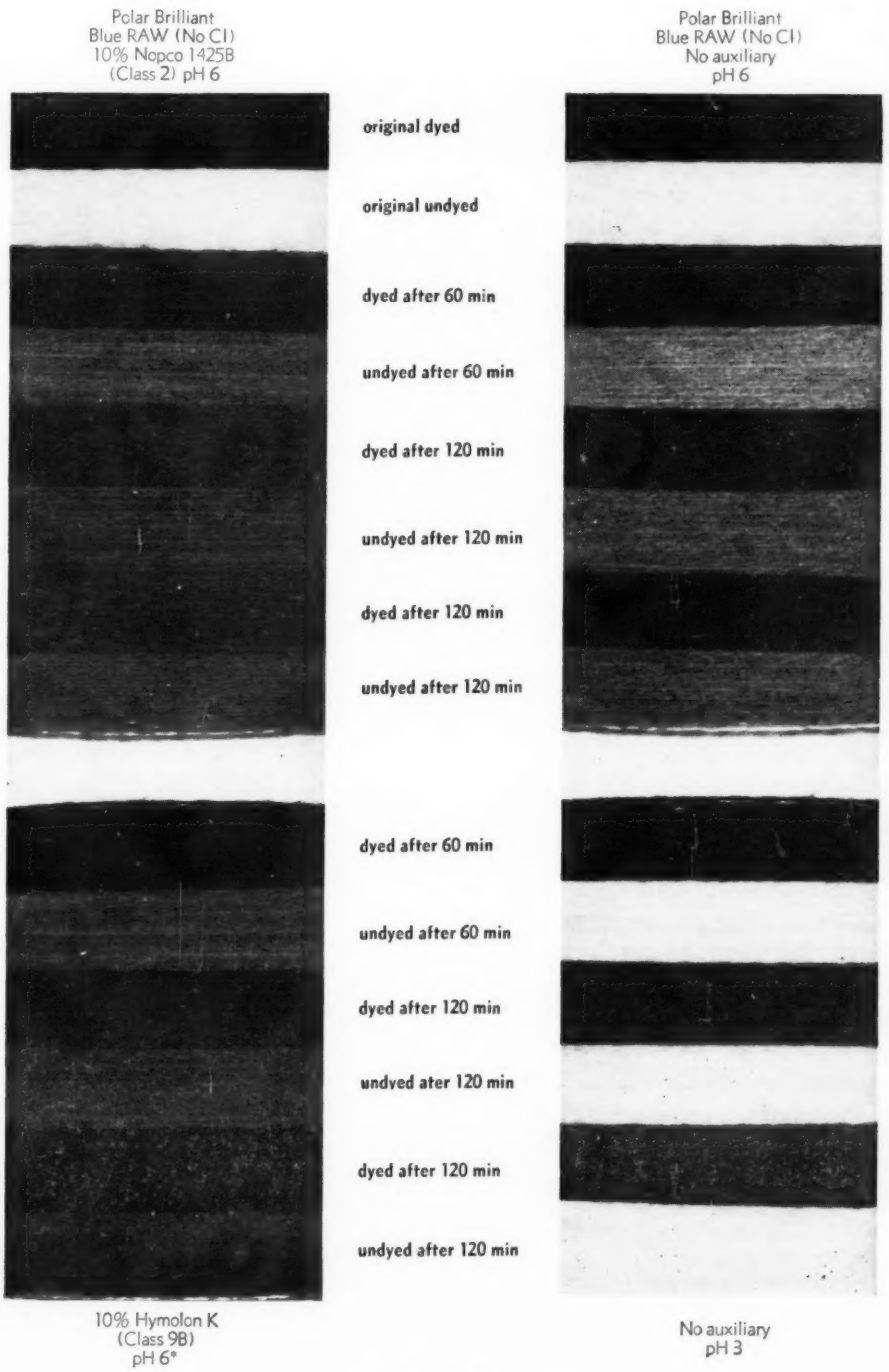
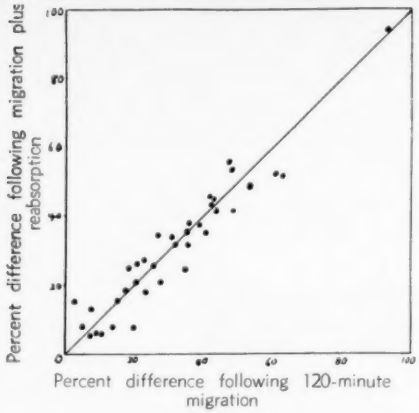


Figure 6
Migration Tests on Wool (210°F)

* acetic acid to pH 5.2 added at 60 min on Hymolon K test



Graph A

Comparison of percent difference between original dyeing and blank for 120-minute migration vs 60-minute migration followed by 60-minute reabsorption.

seem to cause noticeable precipitation. Sapamine KW, more strongly cationic and chemically different in constitution and functional use from the other products, does cause serious dye precipitation and shade change and probably should be avoided as a leveling auxiliary.

Upon careful perusal of the data in Table III-A, it is noted that the different values for the two-hour migration tests and the one-hour readsorption are consistently the same for each auxiliary tested. This indicates that, during the hour of readsorption, migration continues at approximately the rate of migration in the second hour exhibited by the two-hour migration test, and the desorbed dye distributes itself equally between the originally dyed and the blank skein.

Graph A is a plot of the difference values of the two-hour migration versus the one-hour migration, one-hour reabsorption. Admittedly, there is considerable scatter of the plotted points; however, there is little doubt of the linear relationship involved. A 45° line has been drawn on the graph through the origin. It is evident that this line is a good estimate of the best straight line through the points.

This relationship points to the possibility that this type of screening procedure can be conducted with only one migration time.

It is rather difficult to look at a long list of values, such as shown in Table III-A, and to draw sharp conclusions. To permit a closer review of the performance of these auxiliaries by classes, the information in Table III-A is summarized in Table III-B.

Auxiliary-class average difference between original and blank skein after the two-hour migration are shown in this table, ignoring the desorption level at which these differences occurred. A small

TABLE III-A

4% POLAR BRILLIANT BLUE RAW 110% (CI none)

Migrations @ pH 6.0; Reabsorptions Acidified to Reach pH 5.2; 10% Auxiliary on Weight of Fiber

Auxiliary Classification	*Auxiliary*	*Transfer Index After 60 min*	*Transfer Index After 120 min*	*Transfer Index 60-min Migration* plus 60-min Reabsorption*
Control	distilled water	68/9	65/21	68/21
1	Sandozol N	83/4	67/13	80/21
2	Alkanol B	56/2	50/7	59/18
	Tamol N	65/6	58/15	65/21
	Albatex WS	81/1	80/2	90/5
3	Nacconol NR	71/4	60/11	69/25
	Alkanol DW	53/3	45/8	64/25
	Regal	70/4.5	60/12	63/21
	Kreelon CD	64/6	60/12	75/17
	Orvus Neutral Granules	62/6	50/16	70/25
4	Eriopon 31W	62/24	55/38	56/38
	Sandopan TFL	90/10	73/20	78/22
5	Algepon P	67/14	24/62	29/69
6	Marasperse	65/11	62/20	70/20
7	Deceresol/OT	55/3	50/10	65/26
8A	Sandopan A	74/5	64/10	83/15
	Sandopan PO	85/15	68/24	70/28
9A	Igepal CA Ext High Conc	75/20	75/27	80/25
	Nonic 218	89/5	100/7	100/6
9B	Hymolon K	67/27	60/45	65/35
	Syntholite 170	70/30	68/43	65/45
	Nonionic A60	58/25	54/32	64/35
10	Ricinole	65/4	60/17	70/25
	Sandozol KB	82/4	65/12	84/15
11	Sapamine KW	50/24	50/35	36/27
	Peregal OK	60/26	52/31	58/37
	Sandolan ML	54/24	43/26	46/26
	Nopco 1425B	46/16	37/23	27/21
13A	Sequestrene NA_4	62/17	58/24	64/27
13B	sodium tripolyphosphate	60/13	53/31	56/28
	diammonium phosphate	61/26	62/29	64/29
14	anhydrous sodium sulfate	73/13	67/24	70/26
	ammonium sulfate	69/19	65/28	60/34
9A	Irgasol A	60/7	57/13	64/22
	Neovadine A	19/4	10/4	10/4

* Reabsorption accomplished with acetic acid, 56%.

Dyestuff	*Auxiliary Group*	*Auxiliary % owf Product*	*Initial pH*	*Final pH*	*Transfer Index 120 min*
2% Alizarol Brown EB	11	10 Sandolan ML	—	5.1	80/6
	13A	10 Sequestrene NA_4	10.3	7.1	80/4
	14	10 sodium sulfate, anhydrous	—	6.7	95/3
	9A	10 Neovadine A	8.5	7.0	70/2
		10 Neovadine A 5 acetic acid, 56%	4.0	4.4	70/1
		10 Neovadine A 5 formic acid, 85%	3.1	3.1	70/2
		10 Neovadine A 5 sulfuric acid, 96%	2.0	2.5	54/2
		10 Neovadine A 5 oxalic acid	2.3	3.2	40/4
		Control, distilled water	—	7.1	100/1
1.5% Alizarine Sapphire BN Conc 150%	11	10 Nopco 1425B 10 sodium sulfate, anhydrous 2 sulfuric acid, 96%	2.5	3.1	43/40
	11	10 Sandolan ML 10 sodium sulfate, anhydrous 2 sulfuric acid, 96%	2.7	3.1	48/42
	14	10 sodium sulfate, anhydrous	6.5	3.9	50/42
	14	40 sodium sulfate, anhydrous	6.5	4.1	36/28
	14	10 sodium sulfate, anhydrous 2 sulfuric acid, 96%	2.4	2.9	52/45
	14	sodium carbonate to maintain pH 6.0	6.0	5.8	28/17
4% Cibalan Brown BL	15	10 Irgasol A	—	6.0	65/22
	11	10 Nopco 1425B	—	6.4	38/18
	11	10 Sandolan ML	—	5.2	60/20
	14	10 sodium sulfate, anhydrous	—	5.9	68/30
	14	1 formic acid, 85%	—	3.4	90/5
	9A	10 Neovadine A	—	5.8	25/8
		Control, distilled water	—	5.8	68/22

TABLE III-B

AUXILIARY GROUP DIFFERENCES (ORIGINAL-BLANK) FOR TWO-HOUR MIGRATION TESTS ON POLAR BRILLIANT BLUE RAW 110%

Auxiliary Group	No. of Auxiliaries Tested	Group Average (% Difference) (Original-Blank)	Maximum (% Difference) (Original-Blank)	Minimum (% Difference) (Original-Blank)
Control	—	44	44	44
1	1	54	54	54
2	3	55	78	43
3	5	43	49	34
4	2	35	53	17
5	1	—	—	—
6	1	42	42	42
7	1	40	40	40
8A	2	49	54	44
9A	2	70	93	48
9B	3	21	25	15
10	2	48	53	43
11	4	17	21	14
13A	1	34	34	34
13B	2	28	33	22
14	2	40	43	37

TABLE III-C

MIGRATION TESTS SHOWING THE EFFECT OF ANHYDROUS-SODIUM-SULFATE ADDITIONS WITH POLAR BRILLIANT BLUE RAW 110% (CI NONE)

Auxiliary Classification	Auxiliary	Percent	Transfer Index 60 min	Transfer Index after 120 min	Transfer Index 60 min of Migration plus 60 min of Reabsorption*	pH after 60 & 120 min of Migration	pH after 60 min of Migration plus 60 min of Reabsorption
4	Eriopon 31W	10	40/16	32/23	45/36	7.2	5.4
	Eriopon 31W		46/24	40/32	52/41	6.5	5.4
	anhydrous sodium sulfate	10					
11	Sapamine KW	10	50/24	50/35	36/27	5.8	4.7
	Sapamine KW	10	52/29	48/35	40/26	5.6	4.9
	anhydrous sodium sulfate	10					
14	formic acid, 85%	1	98/2	98/2	—	3.3	—
	formic acid, 85%	1	90/16	71/28	—	4.1	—
	anhydrous sodium sulfate	10					
	distilled water	—	92/5	90/11	—	4.2	—
	distilled water	—	72/14	65/23	—	4.7	—
	anhydrous sodium sulfate	10					

* Acetic acid was added to Eriopon 31W and the Sapamine KW baths at the end of 60 min for reabsorption.

average difference indicates good migration.

The difference between the best and poorest performers of each class are shown to give an idea of the range within each class of auxiliaries. The difference value for the control test is shown and it can be used in evaluating the effect of the auxiliaries in classes. It is evident that most of the auxiliaries do not improve the migration of this dye over that of the control.

The important exceptions, in order of decreasing effect are the previously mentioned cationic-active agents of Class 11 (Graph 18), the Ninol amine condensates of Class 9B (Graph 22), and the complex phosphates of Class 13B (Graph 19). These products show with reasonable consistency the ability to bring about more complete and quicker leveling of Polar Brilliant Blue RAW 110% than occurs in a normal dyebath. One product in Class 4, Eriopon 13-W (Graph 20) gave good results but the consistency of results for that class was not good.

Neovadine A, claimed to be both cationic and nonionic depending upon dyebath pH conditions, listed in Class 9 A, actually makes the best showing of any single auxiliary as measured by this different criterion. It brought the dyed and blank skein within 6% of each other. Unfortunately, the desorption 86% of the total dye is so extremely high and irreversible that its action must be considered stripping rather than leveling. However, as Neovadine A does not harm the wool, in contrast to strongly alkaline or sulfoxylate procedures, it may well be used to remove color from an uneven dyeing with subsequent redyeing to the desired shade.

A limit of approximately 50% was set as the minimum amount of dye which must be present on the two skeins, either after migration or readsorption, for an

TABLE III-D

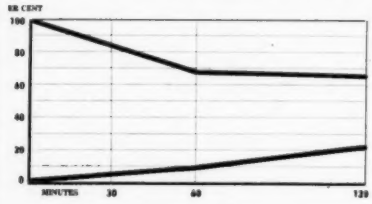
MIGRATION AT pH BROUGHT ABOUT BY AUXILIARY AND WOOL SYSTEM, REABSORPTION TO REACH pH 5.2, IF POSSIBLE ON POLAR BRILLIANT BLUE RAW 110% (CI NONE)

Auxiliary Classification	Auxiliary Need	% owf	Transfer Index 60 min	Transfer Index 120 min	Transfer Index 60 min of Migration plus 60 min of Reabsorption	Initial pH	pH after 60 & 120 min of Migration	pH after 60 min of Migration plus 60 min of Reabsorption
4	Eriopon 31W	10	34/12	28/21	55/45	9.0	7.6	5.0
13	Sequestrene NA$_4$	10	24/8	19/12	50/45	10.3	7.9	5.4
	tetrasodium pyrophosphate	10	22/12	22/19	54/39	10.1	7.4	5.9
	sodium tripolyphosphate	10	26/15	28/20	—	9.7	7.2	5.5
	diammonium phosphate	10	60/18	59/29	56/33	7.6	5.9	5.9
14	* anhydrous sodium sulfate	10	72/14	65/23	—	6.6	4.7	—
	* ammonium sulfate	10	80/15	70/28	—	4.9	4.7	—
	ammonia	10	31/2	35/15	60/33	10.5	6.9	5.1
	sodium hydroxide	1.0	12/2	8/3	52/44	—	8.0	5.1
	sodium carbonate	1.0	39/2	44/9	60/36	10.1	6.8	5.0
	* formic acid, 85%	1.0	98/2	98/2	—	2.9	3.3	—

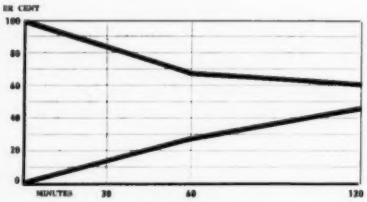
* No reabsorption tests were made as desorption at end of 60 min of migration was insignificant. Acetic acid, 56% was used to reabsorb dye.

MIGRATIONS ON WOOL

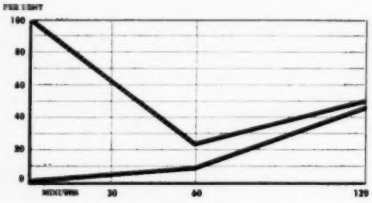
(Upper lines indicate percentages on dyed fiber; lower, on undyed)



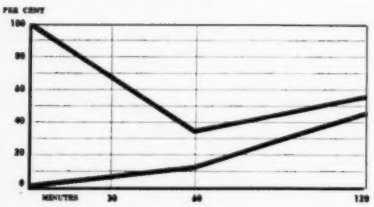
Graph 17
Polar Brill Blue RAW 110% (No CI)
No auxiliary; pH 6.0



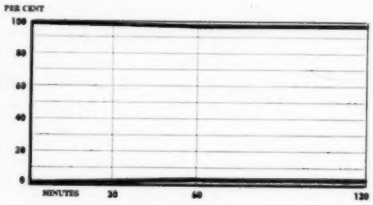
Graph 18
Polar Brill Blue RAW 110% (No CI)
10% Hymolon K (Class 9B)



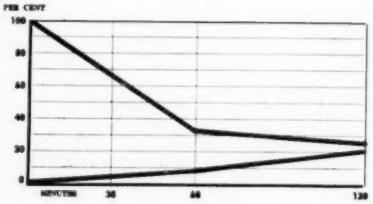
Graph 19
Polar Brill Blue Raw 110% (No CI)
10% Sequestrene NA4 (Class 13A)
Initial pH, 10.3; final pH, 7.9 at 60 min, 5.0 at 120 min



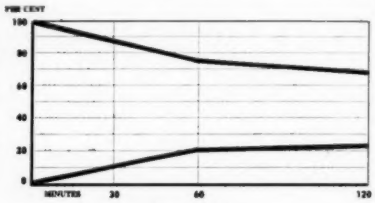
Graph 20
Polar Brill Blue RAW 110% (No CI)
10% Eriopon 31-W (Class 4)
Initial pH, 6.0; final pH, 7.6 at 60 min, 5.0 at 120 min



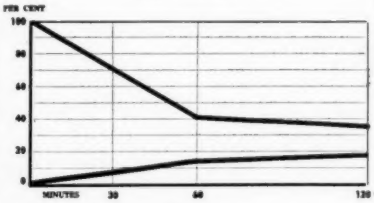
Graph 21
Polar Brill Blue RAW 110% (No CI)
1% formic acid, 85% (Class 14)
pH 3



Graph 22
Polar Brill Blue RAW 110% (No CI)
10% Nopco 1425-B (Class 11) and
1% formic acid, 85% (Class 14)
pH 3.6



Graph 23
4% Cibalan Brown BL
No auxiliary



Graph 24
4% Cibalan Brown BL
10% Nopco 1425-B (Class 11)

auxiliary to be considered as a leveling agent. On this basis, Neovadine A is considered in this discussion of auxiliaries tested as a stripping agent.

EFFECT OF GLAUBER'S SALT——The reasonable question was raised during the progress of this work as to whether or not Glauber's salt should be used in migration baths in addition to the auxiliaries. For certain acid dyestuffs at correct pH conditions, it is a well known fact that Glauber's salt aids greatly in leveling and increases desorption *(5, 12)*. The evidence of benefit from the use of Glauber's salt for dyes of the neutral-dyeing milling type is not nearly so convincing. Some references *(3, 13)* claim that, for pH conditions above 5.0, Glauber's salt can be of detrimental effect in the dyebath.

With use of the test procedure, a few of the auxiliaries, picked at random, were tested both with and without 10% anhydrous sodium sulfate in the bath. The data from these tests are shown in Table III-C. The formic acid and distilled-water tests were conducted with no effort to maintain a bath pH of 6.0, purposely to allow low pH conditions to be represented. It is obvious that at pH 6.0 the sodium sulfate did not change the amount of migration as compared with results without salt. At the two low pH tests the effect of sodium sulfate was very pronounced and beneficial. In the case of the distilled-water tests, the desorption effect of the sulfate is evident. In the very low pH tests with formic acid, desorption was suppressed but did not interfere with improving migration. On the basis of this evidence, it was decided to keep the sodium sulfate out of the pH 6.0 level studies, except for those tests representing sodium sulfate (Glauber's salt) as an auxiliary itself.

Table III-D shows the migration and reabsorption data obtained with a number of common chemicals including alkalis, acids, acid-forming compounds and one surface-active auxiliary that contains a complex alkaline phosphate. It is evident that, for the Polar Brilliant Blue RAW 110% dyeing with high initial and final pH values significantly above 6.0, desorption is high and, in a number of cases is in excess of 50%. All of these systems are reversible, if sufficient acid is added to overcome the total alkalinities, and, except for the two complex phosphates, maintain approximately the same percent difference between the dyed and blank skeins after total readsorption.

Obviously the strong alkalis used, sodium hydroxide and soda ash, would never be used in a wool dyehouse; however, it is possible that the milder alkalis might be used. Of the mildly alkaline auxiliaries, the Sequestrene NA4 (Class 13 B) and Eriopon 31W (Class 4) gave noticeably good leveling action on the desorption-readsorption procedure (Graphs 19 and 20).

Spot measurements indicate that equilibrium desorption was reached earlier in the desorption step than 60 minutes. A shorter boiling time with less damage to the wool would probably give as much desorption as the 60-minute point shown on the graph.

RESULTS WITH OTHER DYES——A limited number of experiments were conducted on the dyeing of Alizarol Brown EB, a chrome dye, Alizarine Sapphire BN, a level-dyeing acid dye, and Cibalan Brown BL, a neutral-dyeing premetalized dye. These tests were limited to 120-minute migration periods with those auxiliaries and combinations that preliminary work and the work on dyeing Polor Brilliant Blue RAW 110%

showed promise for the particular dyeing involved.

Table III-A shows the results of these experiments. The migration properties of the Alizarol Brown EB dyeing are not sufficiently improved by any of the treatments tried to be of practical value. Only the treatment with Neovadine A and oxalic acid caused a significant lowering of the difference between the two skeins. The action which took place here is again stripping, typical of Neovadine A in high concentrations. The oxalic acid partially broke the chromic complex so that after redyeing, the shade would have to be rechromed for fastness purposes. This sketchy work on this dye indicates little hope for leveling chrome dyes after they have been chromed.

Alizarine Sapphire BN exhibits such good migration properties in a typical dyebath containing Glauber's salt and sulfuric acid, that the effect of Class 11 auxiliaries seems to be insignificant, considering the rather large experimental error present in our testing procedure. Even the high desorption tried with 40% anhydrous sodium sulfate did not bring the two skeins as close together as a standard dyebath. Dyes typified by Alizarine Sapphire BN Conc 150% undoubtedly can be leveled by strong boiling for longer periods in a standard bath as well as by any other means.

On the dyeing of Cibalan Brown BL in a two-hour migration test at pH 6.0, the class representatives Nopco 1425-B and Neovadine A brought the dyed and blank skeins considerably closer than any of the other systems tried. These results seem to depend upon the desorbing ability of these products.

To give a more complete picture of the benefit to the migrating power of the Class 11 auxiliaries, additional tests were run with 10% Nopco 1425-B. Graph 24 illustrates for 60- and 120-minute migration periods at the boil how much closer the original dyeing and the blank are brought together as compared with the same periods of migration with no auxiliary shown in Graph 23.

Not shown in Graph 24 are the results of an additional test made with Nopco 1425-B as the migration assistant. This test was a 60-minute migration followed by an addition of 1% acetic acid, 56%, to the bath and 60 minutes longer at the boil. The object of this test was to determine how much reabsorption of dye could be affected with this dye, which normally has great affinity for wool when the bath pH is lowered. The measurement obtained following this test was in the ratio 34/18. The total amount of dye on the two skeins is exactly the same and slightly closer than the 35/17 result of the two-hour migration. This resistance to reabsorption in spite of the addition of acid checks the findings for the Class 11 auxiliaries and Neovadine A on the Polar Brilliant Blue RAW 110%.

SUMMARY OF RESULTS ON WOOL ——The important results of the work done on dye wool to bring about better leveling are summarized in the following points:

1) Certain auxiliaries of the weakly cationic type, such as Nopco 1425-B and Sandolan ML (Class 11) and Alkamine

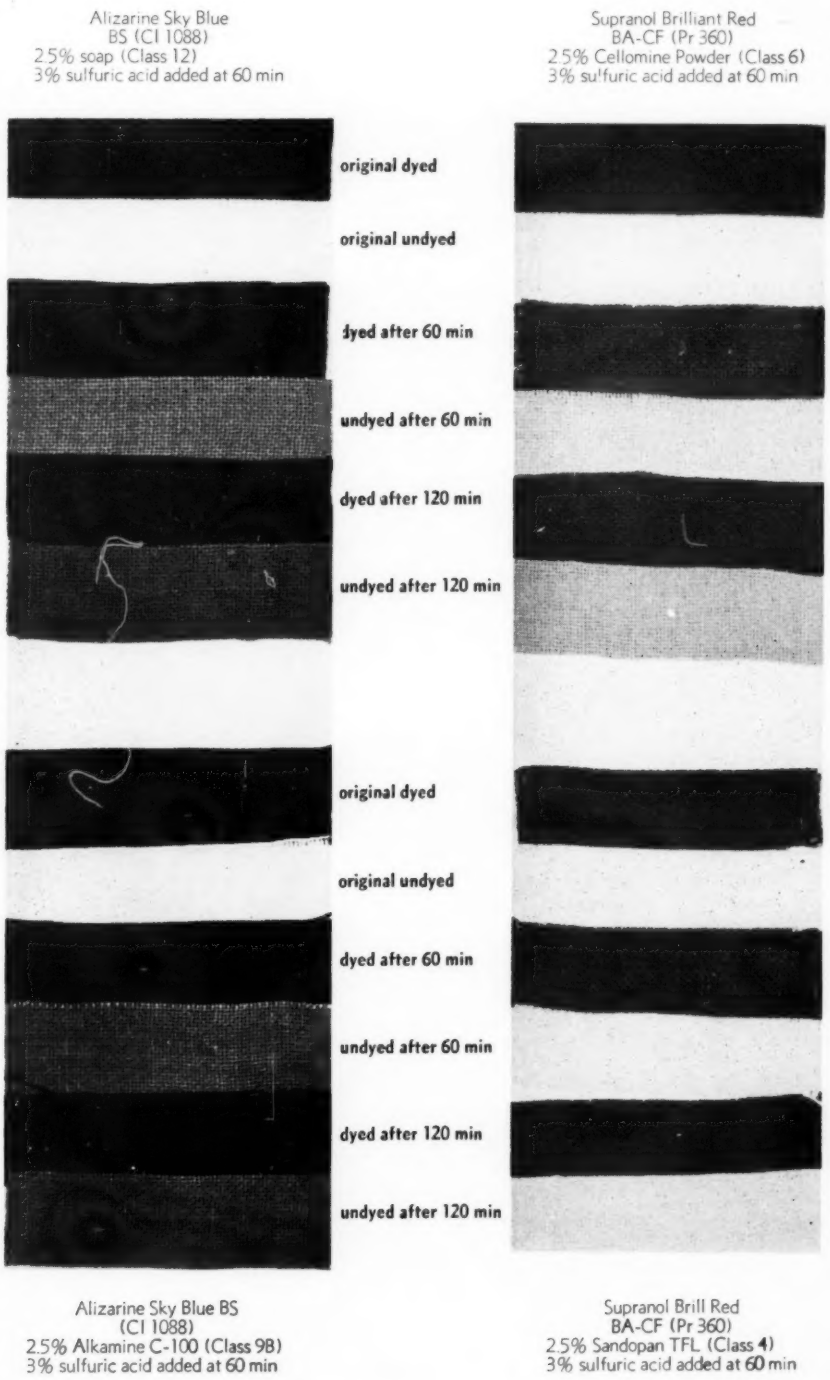

Alizarine Sky Blue
BS (CI 1088)
2.5% soap (Class 12)
3% sulfuric acid added at 60 min
Supranol Brilliant Red
BA-CF (Pr 360)
2.5% Cellomine Powder (Class 6)
3% sulfuric acid added at 60 min
original dyed
original undyed
dyed after 60 min
undyed after 60 min
dyed after 120 min
undyed after 120 min
original dyed
original undyed
dyed after 60 min
undyed after 60 min
dyed after 120 min
undyed after 120 min
Alizarine Sky Blue BS
(CI 1088)
2.5% Alkamine C-100 (Class 9B)
3% sulfuric acid added at 60 min
Supranol Brill Red
BA-CF (Pr 360)
2.5% Sandopan TFL (Class 4)
3% sulfuric acid added at 60 min

Figure 7
Migration Tests on Acrilan (210°F)

C-100 (Class 9B), show promise in improving the leveling or migration properties of wool dyes, particularly those of the neutral-dyeing or milling class.

2) There is no indication that unevenly dyed chrome dyes (fully chromed) could be made level by using auxiliaries. Probably improvement of the kind shown on the milling acid dye can be arrived at by working on the chrome dye before chroming. Such a possibility requires further proof than given here.

3) Dyes of the equalizing acid-dyeing class have such good migration properties that it is doubtful that any auxiliary would improve migration rates.

4) One method of obtaining an eventually level result on an unevenly dyed woolen material is to bring about very high desorption with materials like alkaline auxiliaries and certain special dye desorbing chemicals, such as Neovadine A. Whether such treatments are safe or economical depends upon the specific situation. These treatments might be considered stripping, although they function differently from the oxidation or reduction types of stripping procedures.

5) When migration properties of a dye are being measured to show the influence of various dyebath auxiliaries, one transfer test at a judiciously chosen time might probably serve quite as satisfactory for rating purposes as a series of tests at various times for each auxiliary. This test should be supplemented with pertinent information concerning read-sorption characteristics of the particular systems.

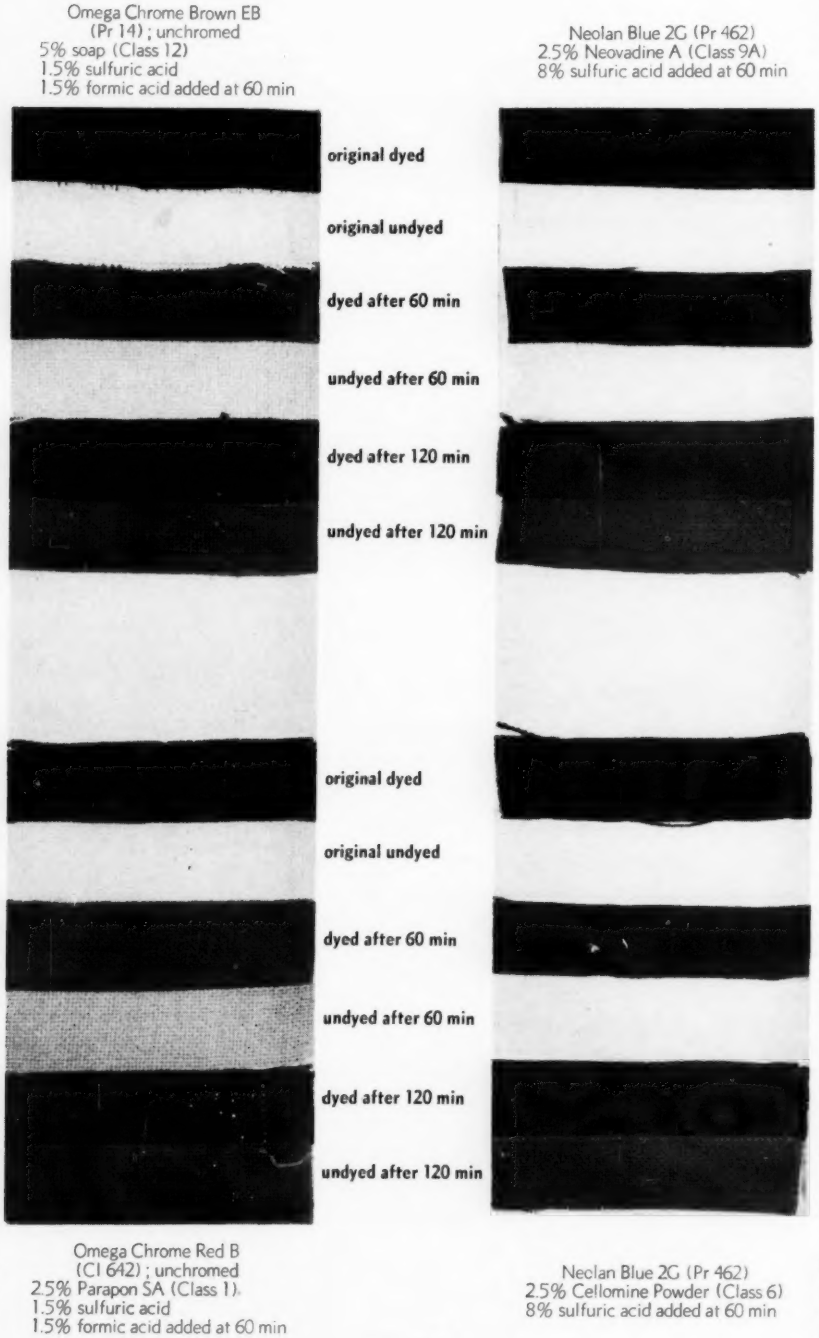

Omega Chrome Brown EB
(Pr 14) ; unchromed
5% soap (Class 12)
1.5% sulfuric acid
1.5% formic acid added at 60 min
Neolan Blue 2G (Pr 462)
2.5% Neovadine A (Class 9A)
8% sulfuric acid added at 60 min
original dyed
original undyed
dyed after 60 min
undyed after 60 min
dyed after 120 min
undyed after 120 min
original dyed
original undyed
dyed after 60 min
undyed after 60 min
dyed after 120 min
undyed after 120 min
Omega Chrome Red B
(CI 642) ; unchromed
2.5% Parapon SA (Class 1)
1.5% sulfuric acid
1.5% formic acid added at 60 min
Neolan Blue 2G (Pr 462)
2.5% Cellomine Powder (Class 6)
8% sulfuric acid added at 60 min

Figure 8
Migration Tests on Acrilan (200°F)

ACRILAN

EXPERIMENTAL———Acrilan is produced by the Chemstrand Corporation at a plant located in Decatur, Alabama. It is basically a polyacrylonitrile fiber, which has been modified by adding chemical groups that permit it to accept acid type dyestuffs in somewhat the same manner as wool itself accepts them. For this investigation, acid, premetalized and chrome dyestuffs were used. The acid dyestuffs are represented by Alizarine Sky Blue BS and Supranol Brilliant Red BA-CF, the acid-dyeing premetalized represented by Neolan Blue 2G and Neolan Red BRE and the chromes by Omega Chrome Red B and Omega Chrome Brown EB. They were dyed in depths approximately 2.0% of Alizarine Blue SAP on wool.

It is realized that the use of unchromed dyestuffs is not the most practical approach to this problem; however, it is felt that if these dyestuffs are once chromed, leveling will be impractical, and chemical stripping and redyeing would be necessary. In most instances, it is recommended that the chrome dyestuff be chromed in a separate bath. This procedure would present the opportunity of inspection for levelness before chroming and leveling procedures could be instituted before chroming is started.

TEST PROCEDURES———Migration tests were made by following the general procedure used on all the fibers. This addition of auxiliary alone or with an alkali produced desorption only with little if any migration to the undyed sample. The addition of auxiliary and acid at the

beginning of the test resulted in unevenness on both the originally dyed and the undyed samples. Therefore, all tests were a desorption interval for the first 60 minutes with auxiliary, followed by reabsorption with gradual additions of acid to the bath for the final 60-minute period.

In order to simulate the condition of an unevenly dyed material, the undyed fabrics used in this work were pretreated in a blank dyebath before being used in the leveling tests. This pretreatment was found necessary because of Acrilan's ability to retain a small amount of acid from the dyebath, which increases affinity for dye. This effect is noticeable on milling-type dyes during the first hour of desorption and has been illustrated on Graphs 25 and 26 concerning acid dyes. As acid is added to the bath during the reabsorption period, the effect of the small amount of retained acid is overcome and the final effect is not so great as might be expected from the examination of swatches after 60 minutes. The acid-dyeing premetalized dyes do not show the effect of this retained acid since the amount is too small to increase the affinity of this type of dyestuff during the initial 60 minutes or to be of much consequence in the presence of the 6 to 8% of sulfuric acid used for reabsorption.

No 60-minute Transfer Index is given for the acid-dyeing premetalized migration tests since there is no transfer of dye to the undyed material until acid is added after 60 minutes.

DISCUSSION———from the Transfer-Index ratings, it appears that the nonionic auxiliaries have generally produced the best results. Soap or soda ash gave good results on the milling-type dyes (figure 7) but caused excessive shade change on the chrome and acid-dyeing premetalized types. Since Acrilan acts in an acid dyebath as if it were positively charged, anionic materials placed in the dyebath may tend to compete with the dyestuff for available dye sites. Thus, any dyestuff desorbed in the first 60-minute period will probably encounter interference in reabsorption in baths containing these anionic materials, even though an appreciable amount of dyestuff has been desorbed. Conversely, the cationic reagents may have the property of displacing acid type dyestuffs from Acrilan but probably compete with the fiber and limit the dyestuffs' reabsorption. The nonionic agents theoretically, therefore, should not interfere with either desorption or reabsorption and, on the basis of the results, generally appear to be better for leveling. Examples of the nonionic agents are Alkamine C-100 (Class 9 B, Figure 7), Cerfax N-100 (Class 9 B, Graph 31), and Diazopan AN (Class 9 A, Graph 29). It was interesting to note that Cellomine Powder (Class 6) improved migration of the milling-acid-type dye (Figure 7), whereas, when added to a migration bath of premetalized dye, transfer was very poor (Figure 8). Products such as Neovadine A (Class 9 A) show very good desorbing characteristics but also show a reluctance to permit reabsorption of the dyestuff. Although there appears to be a high degree of leveling because both swatches are approximately the same shade after the addition of acid to exhaust the dye from the bath, desorption is high and a new bath would be necessary for redying to the original shade (Figure 8).

Generally, it appears from the results of these tests that Acrilan may present some difficulties in the leveling of unevenly dyed materials. The premetalized dyestuffs are apparently the most easy to level with the acid and chrome following in that order. It has also been observed that several of the types of auxiliaries as exemplified by Classes 13 and 14 (Nullapon B and sodium carbonate) result in radical color changes, especially in the premetalized and chrome-type dyestuffs. This effect by Nullapon is to be expected on the premetalized dyes because of its sequestering action on the metallic ions of the dyestuff molecule.

TABLE IV-A

ACRILAN MIGRATION TESTS WITH ACID DYESTUFFS

Original Dyeings

2.5% Supranol Brilliant Red BA-CF (Pr 360)

3.75% Alizarine Sky Blue BS (CI 1088)

Test No.	Dye	Auxiliary % owf	Class	Initial pH	Final pH	Addition 60 min % owf	Transfer Index 60 min	Transfer Index 120 min
1	Red	2.5 Levelene	9A	6.0	2.0	2.5 sulfuric acid	98/1	93/1
	Blue	2.5 Levelene	9A	6.0	2.0	2.5 sulfuric acid	92/6	80/18
2	Red	30 Glauber's salt	14	—	—	2.5 sulfuric acid	91/7	91/8
	Blue	30 Glauber's salt	14	—	—	2.5 sulfuric acid	83/16	76/23
3	Red	2.5 Neovadine A	9A	8.0	2.0	4.0 sulfuric acid	62/8	57/21
	Blue	2.5 Neovadine A	9A	8.0	2.0	4.0 sulfuric acid	50/10	40/27
4	Red	2.5 Parapon SA	1	6.0	2.0	3.0 sulfuric acid	97/1	97/2
	Blue	2.5 Parapon SA	1	6.0	2.0	3.0 sulfuric acid	88/9	72/27
5	Red	2,5 Nekal BX	2	6.0	2.0	3.0 sulfuric acid	96/3	91/3
	Blue	2,5 Nekal BX	2	6.0	2.0	3.0 sulfuric acid	82/16	78/21
6	Red	2.5 Sandopan TFL	4	7.5	2.0	3.0 sulfuric acid	98/1	97/2
	Blue	2.5 Sandopan TFL	4	7.5	2.0	3.0 sulfuric acid	80/8	85/13
7	Red	2.5 Alkanol DW	3	6.0	2.0	3.0 sulfuric acid	97/2	90/2
	Blue	2.5 Alkanol DW	3	6.0	2.0	3.0 sulfuric acid	90/8	76/22
8	Red	2.5 Cellomine Powder	6	6.0	2.0	3.0 sulfuric acid	88/8	85/12
	Blue	2.5 Cellomine Powder	6	6.0	2.0	3.0 sulfuric acid	80/10	80/18
9	Red	2.5 Deceresol OT	7	6.0	2.0	3.0 sulfuric acid	84/15	81/18
	Blue	2.5 Deceresol OT	7	6.0	2.0	3.0 sulfuric acid	80/10	77/20
10	Red	no auxiliary	—	—	—	—	98/1	97/2
	Blue	no auxiliary	—	—	—	—	90/4	87/11
11	Red	2.5 Maypon K	5	—	—	3.0 sulfuric acid	95/4	92/7
	Blue	2.5 Maypon K	5	—	—	3.0 sulfuric acid	82/8	80/16
12	Red	2.5 Hartopon	8A	7.5	2.0	3.0 sulfuric acid	96/3	95/2
	Blue	2.5 Hartopon	8A	7.5	2.0	3.0 sulfuric acid	77/22	77/22
13	Red	2.5 Peregal OK	11	6.5	2.0	3.0 sulfuric acid	96/3	94/5
	Blue	2.5 Peregal OK	11	6.5	2.0	3.0 sulfuric acid	90/8	80/17
14	Red	2.5 Versene	13B	10	2.0	3.0 sulfuric acid	89/8	78/20
	Blue	2.5 Versene	13B	10	2.0	3.0 sulfuric acid	70/20	65/34
15	Red	2.5 neutral soap	12	7.5	2.0	3.0 sulfuric acid	82/18	78/21
	Blue	2.5 neutral soap	12	7.5	2.0	3.0 sulfuric acid	84/14	70/29
16	Red	2.5 Peregal O	9A	6.0	2.0	3.0 sulfuric acid	97/2	96/3
	Blue	2.5 Peregal O	9A	6.0	2.0	3.0 sulfuric acid	94/5	85/17
17	Red	2.5 Protectol	6	6.0	2.0	3.0 sulfuric acid	97/1	96/2
	Blue	2.5 Protectol	6	6.0	2.0	3.0 sulfuric acid	92/7	90/10
18	Red	2.5 Albatex PO	15	5.0	2.0	3.0 sulfuric acid	88/10	85/14
	Blue	2.5 Albatex PO	15	5.0	2.0	3.0 sulfuric acid	75/13	76/22
19	Red	2.5 Tergitol 7	8B	5.0	2.0	3.0 sulfuric acid	90/9	87/12
	Blue	2.5 Tergitol 7	8B	5.0	2.0	3.0 sulfuric acid	80/18	78/19
20	Red	2.5 Alkamine C	9B	7.0	2.0	3.0 sulfuric acid	88/8	80/18
	Blue	2.5 Alkamine C	9B	7.0	2.0	3.0 sulfuric acid	75/20	70/25
21	Red	2.5 Velvosheen	10	5.0	2.0	3.0 sulfuric acid	93/6	94/6
	Blue	2.5 Velvosheen	10	5.0	2.0	3.0 sulfuric acid	88/11	80/19
22	Red	2.5 sodium carbonate	14	10.4	2.0	4.0 sulfuric acid	50/0	65/30
	Blue	2.5 sodium carbonate	14	10.4	2.0	4.0 sulfuric acid	14/4	55/43

TABLE IV-B

ACRILAN LEVELING TESTS WITH PREMETALIZED DYESTUFFS

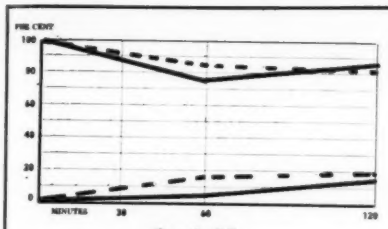
Original Dyeings

Neolan Red BRE (Pr 509)
Neolan Blue 2G (Pr 144)

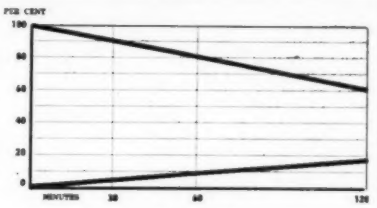
Test No.	Dye	Auxiliary % owf	Class	Initial pH	Final pH	Addition 60 min % owf	Transfer Index 60 min	Transfer Index 120 min
23	Red	water	—	7.5	1.2	8 sulfuric acid		70/27
	Blue	water	—	7.5	1.2	8 sulfuric acid		65/26
24	Red	2.5 Parapon SA	1	6.8	1.2	8 sulfuric acid		68/27
	Blue	2.5 Parapon SA	1	6.8	1.2	8 sulfuric acid		90/10
25	Red	2.5 Nekal BX	2	7.6	1.2	8 sulfuric acid		73/15
	Blue	2.5 Nekal BX	2	7.6	1.2	8 sulfuric acid		60/10
26	Red	2.5 Naccanol NR	3	8.2	1.3	8 sulfuric acid		70/18
	Blue	2.5 Naccanol NR	3	8.2	1.3	8 sulfuric acid		65/10
27	Red	2.5 Igepon T Gel	4	7.7	1.2	8 sulfuric acid		70/20
	Blue	2.5 Igepon T Gel	4	7.7	1.2	8 sulfuric acid		85/15
28	Red	2.5 Maypon K	5	8.6	1.3	8 sulfuric acid		70/18
	Blue	2.5 Maypon K	5	8.6	1.3	8 sulfuric acid		70/19
29	Red	2.5 Cellomine Powder	6	9.4	1.2	8 sulfuric acid		68/17
	Blue	2.5 Cellomine Powder	6	9.4	1.2	8 sulfuric acid		60/13
30	Red	2.5 Deceresol OTB	7	8.2	1.3	8 sulfuric acid		65/28
	Blue	2.5 Deceresol OTB	7	8.2	1.3	8 sulfuric acid		65/13
31	Red	2.5 Duponol LS Paste	8A	8.1	1.3	8 sulfuric acid		55/22
	Blue	2.5 Duponol LS Paste	8A	8.1	1.3	8 sulfuric acid		65/19
32	Red	2.5 Tergitol 7	8B	7.5	1.2	8 sulfuric acid		60/25
	Blue	2.5 Tergitol 7	8B	7.5	1.2	8 sulfuric acid		65/19
33	Red	2.5 Levelene	9A	7.4	1.2	8 sulfuric acid		65/30
	Blue	2.5 Levelene	9A	7.4	1.2	8 sulfuric acid		60/20
34	Red	2.5 Cerfax N-100	9B	8.7	1.3	8 sulfuric acid		50/22
	Blue	2.5 Cerfax N-100	9B	8.7	1.3	8 sulfuric acid		65/20
35	Red	2.5 Alkamine C-100	9B	8.9	1.3	8 sulfuric acid		45/25
	Blue	2.5 Alkamine C-100	9B	8.9	1.3	8 sulfuric acid		60/19
36	Red	2.5 Peregal OK	11	8.0	1.2	8 sulfuric acid		50/22
	Blue	2.5 Peregal OK	11	8.0	1.2	8 sulfuric acid		70/20
37	Red	2.5 soap	12	9.8	1.4	8 sulfuric acid		60/29
	Blue	2.5 soap	12	9.8	1.4	8 sulfuric acid		70/20
38	Red	2.5 Nullopon B	13B	9.1	1.2	8 sulfuric acid		75/14
	Blue	2.5 Nullopon B	13B	9.1	1.2	8 sulfuric acid		70/7
39	Red	2.5 Glauber's salt	14	9.0	1.4	8 sulfuric acid		50/25
	Blue	2.5 Glauber's salt	14	9.0	1.4	8 sulfuric acid		75/18
40	Red	2.5 Neovadine A	9A	8.6	1.3	8 sulfuric acid		35/30
	Blue	2.5 Neovadine A	9A	8.6	1.3	8 sulfuric acid		40/27
41	Red	2.5 Marasperse C	6	8.7	1.3	8 sulfuric acid		80/11
	Blue	2.5 Marasperse C	6	8.7	1.3	8 sulfuric acid		70/12
42	Red	2.5 Marasperse N	6	8.9	1.3	8 sulfuric acid		70/19
	Blue	2.5 Marasperse N	6	8.9	1.3	8 sulfuric acid		75/16
43	Red	2.5 Merpol C	8	8.1	1.3	8 sulfuric acid		60/25
	Blue	2.5 Merpol C	8	8.1	1.3	8 sulfuric acid		60/21
44	Red	2.5 Sterox SE	9A	8.2	1.3	8 sulfuric acid		65/18
	Blue	2.5 Sterox SE	9A	8.2	1.3	8 sulfuric acid		60/20
45	Red	2.5 Invadine D	2	8.2	1.2	8 sulfuric acid		65/29
	Blue	2.5 Invadine D	2	8.2	1.2	8 sulfuric acid		65/24
46	Red	2.5 Duponol ME Dry	8	8.6	1.2	8 sulfuric acid		60/18
	Blue	2.5 Duponol ME Dry	8	8.6	1.2	8 sulfuric acid		60/19
47	Red	2.5 Igepon AP	8	8.6	1.2	8 sulfuric acid		61/35
	Blue	2.5 Igepon AP	8	8.6	1.2	8 sulfuric acid		70/24
48	Red	2.5 Leonil SA	2	8.3	1.2	8 sulfuric acid		63/22
	Blue	2.5 Leonil SA	2	8.3	1.2	8 sulfuric acid		69/23
49	Red	2.5 Invadine B	2	5.5	1.3	8 sulfuric acid		62/33
	Blue	2.5 Invadine B	2	5.5	1.3	8 sulfuric acid		70/19
50	Red	2.5 Arkolene WX	3	8.2	1.2	8 sulfuric acid		63/33
	Blue	2.5 Arkolene WX	3	8.2	1.2	8 sulfuric acid		68/22
51	Red	2.5 Alkanol S Flakes	3	8.3	1.2	8 sulfuric acid		63/32
	Blue	2.5 Alkanol S Flakes	3	8.3	1.2	8 sulfuric acid		70/18
52	Red	2.5 Alipal CO 433	15	8.0	1.2	8 sulfuric acid		70/22
	Blue	2.5 Alipal CO 433	15	8.0	1.2	8 sulfuric acid		70/15
53	Red	2.5 Albatex PO	15	8.3	1.2	8 sulfuric acid		64/27
	Blue	2.5 Albatex PO	15	8.3	1.2	8 sulfuric acid		70/16
54	Red	2.5 Ahcowet RS	1	7.1	1.2	8 sulfuric acid		70/20
	Blue	2.5 Ahcowet RS	1	7.1	1.2	8 sulfuric acid		69/18
55	Red	2.5 Sapamine KWC	11	7.1	1.2	8 sulfuric acid		62/32
	Blue	2.5 Sapamine KWC	11	7.1	1.2	8 sulfuric acid		38/22
56	Red	2.5 Katapol VP	11	8.4	1.2	8 sulfuric acid		70/25
	Blue	2.5 Katapol VP	11	8.4	1.2	8 sulfuric acid		70/20
57	Red	2.5 Emulphor VN	9A	8.6	1.2	8 sulfuric acid		68/20
	Blue	2.5 Emulphor VN	9A	8.6	1.2	8 sulfuric acid		70/17
58	Red	2.5 Nonic 234	9A	7.9	1.2	8 sulfuric acid		68/25
	Blue	2.5 Nonic 234	9A	7.9	1.2	8 sulfuric acid		68/19
59	Red	2.5 Diazopon AN	9A	8.1	1.3	8 sulfuric acid		60/36
	Blue	2.5 Diazopon AN	9A	8.1	1.3	8 sulfuric acid		69/21
60	Red	2.5 Evenate SX	9A	7.6	1.2	8 sulfuric acid		63/35
	Blue	2.5 Evenate SX	9A	7.6	1.2	8 sulfuric acid		67/26
61	Red	2.5 Adaptol	15	6.5	1.2	8 sulfuric acid		68/27
	Blue	2.5 Adaptol	15	6.5	1.2	8 sulfuric acid		67/22
62	Red	2.5 Radiex 81	15	7.7	1.2	8 sulfuric acid		61/37
	Blue	2.5 Radiex 81	15	7.7	1.2	8 sulfuric acid		67/20
63	Red	2,5 Radiex 49	15	7.3	1.2	8 sulfuric acid		65/34
	Blue	2,5 Radiex 49	15	7.3	1.2	8 sulfuric acid		71/21
64	Red	2.5 Exite 24	15	9.3	1.2	8 sulfuric acid		62/33
	Blue	2.5 Exite 24	15	9.3	1.2	8 sulfuric acid		70/20
65	Red	2.5 soda ash	14	10.4	1.3	8 sulfuric acid		63/36
	Blue	2.5 soda ash	14	10.4	1.3	8 sulfuric acid		60/13

MIGRATIONS ON ACRILAN

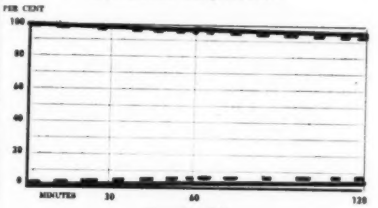
(Upper lines indicate percentage on dyed fiber; lower lines, undyed fiber)



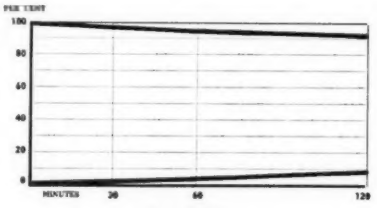
Graph 25
(See Table IV-A, test 9—Red)
Solid lines indicate untreated fiber
Broken lines indicate treated fiber
See Acrilan test procedure



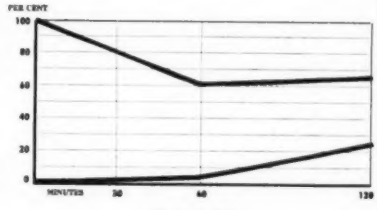
Graph 30
(See Table IV-B, test 54)



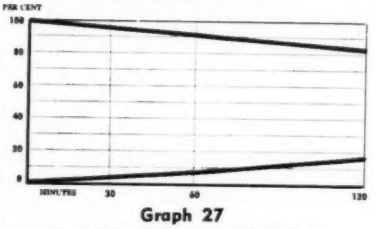
Graph 26
(See Table IV-A, test 13—Red)
Solid lines indicate untreated fiber
Broken lines indicate treated fiber
See Acrilan test procedure



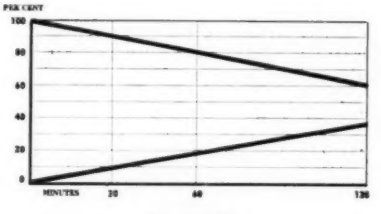
Graph 28
(See Table IV-B, test 24—Blue)



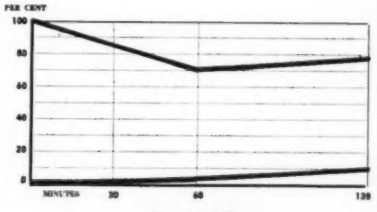
Graph 31
(See able IV-C, test 67)



Graph 27
(See Table IV-B, test 27—Blue)



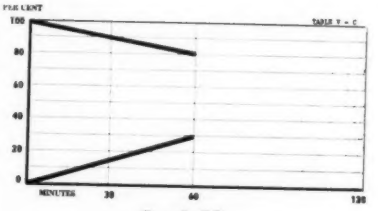
Graph 29
(See Table IV-B, test 59)



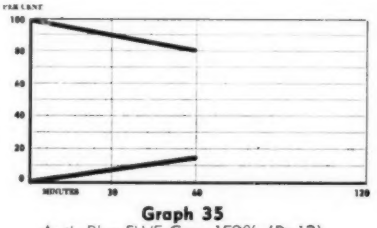
Graph 32
(See Table IV-C, test 71)

MIGRATIONS ON ORLON

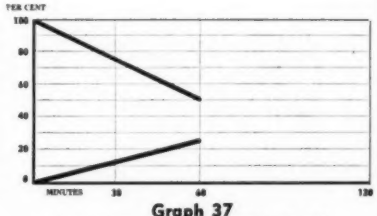
(Upper lines indicate percentages on dyed fiber; lower lines, undyed fiber)



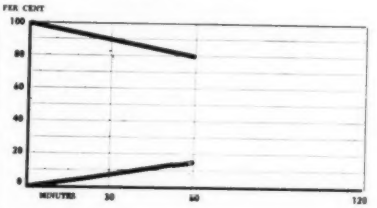
Graph 33
Brill Green Crystals (CI 662)
1% dye, 1 hr at 250°F
2 g/l Cerfax N-100 (Class 9B)
(See Table V-C)



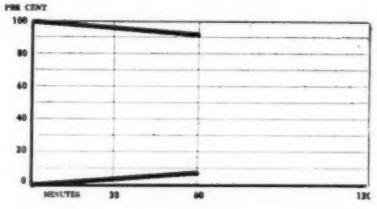
Graph 35
Anth Blue SWF Conc 150% (Pr 12)
1% dye, 1 hr at 212°F
2 g/l Decerosol OT (Class 7)
(See Table V-F)



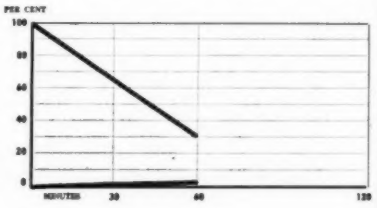
Graph 37
Anth Blue SWF Conc 150% (Pr 12)
1 hr at 250°F
2 g/l Cellomine Powder (Class 6)
(See Table V-G)



Graph 34
Brill Green Crystals (CI 662)
1% dye, 1 hr at 250°F
Control, 0.5% acetic acid
(See Table V-C)



Graph 36
Anth Blue SWF 150% (Pr 12)
1% dye, 1 hr at 212°F
Control
(See Table V-F)



Graph 38
Anth Blue SWF Conc 150% (Pr 12)
1 hr at 250°F
Control
(See Table V-G)

TABLE IV-C

ACRILAN MIGRATION TESTS WITH CHROME DYESTUFFS

5.5% Omega Chrome Red B (CI 652)

4.0% Omega Chrome Brown EB (Pr 14)

Test No.	Dye	Auxiliary % owf	Class	Initial pH	Final pH	Addition 60 min % owf	Transfer Index 60 min	Transfer Index 120 min
66	Red	2.5 Detersol OTB	7	8.2	1.9	1.5 formic acid 1.5 sulfuric acid	80/15	65/15
67	Brown	2.5 Cerfax N-100	9B	8.7	2.2	1.5 sulfuric acid	60/3	68/28
68	Red	2.5 Invadine D	2	8.2	2.0	1.5 sulfuric acid	80/7	80/14
69	Red	2.5 Duponol ME Dry	8	8.6	1.9	1.5 sulfuric acid	60/13	72/24
	Brown	2.5 Duponol ME Dry	8	8.6	1.9	1.5 sulfuric acid	60/15	65/20
70	Red	2.5 soda ash	14	10.4	2.0	1.5 sulfuric acid	3/1	55/39
	Brown	2.5 soda ash	14	10.4	2.0	1.5 sulfuric acid	15/6	74/20
71	Brown	2.5 Parapon SA	1	8.7	2.0	1.5 sulfuric acid	70/3	80/12

ORLON

EXPERIMENTAL ——— Orlon acrylic fiber is dyeable with three classes of colors *(references 14 to 17):* disperse dyes, basic dyes, and acid dyes, the latter assisted by the cuprous ion. Practical dyeing recommendations indicated the use of atmospheric as well as superatmospheric pressure conditions in application. Since no data were available on leveling dyes of these types on Orlon, considerable latitude in auxiliaries was encompassed.

Type 41 Orlon was used in the experiments. Much of the data should be adaptable to Type 42 as well, except the upper dyeing temperature should not be above 230°F. The dyes selected are typical of those being used.

TABLE V-A

BRILLIANT GREEN CRYSTALS

(CI 662)

1% basic dye 1 hr at 205° F

2 g/liter of assistant

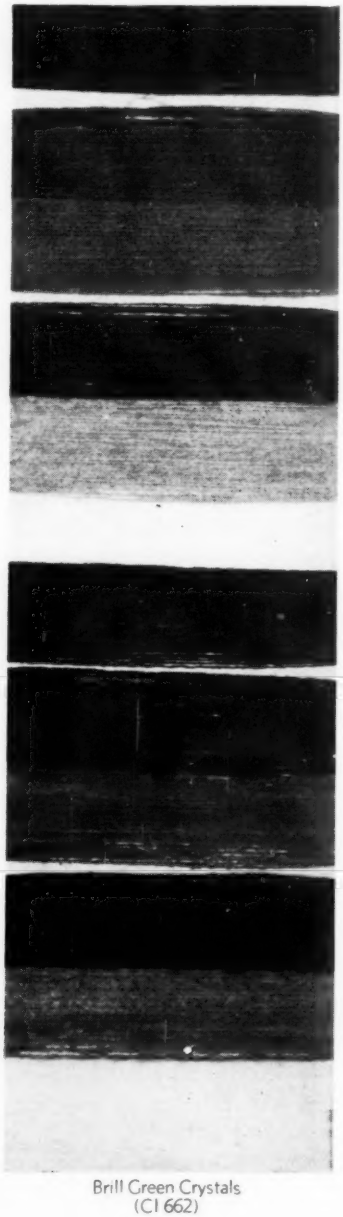
0.5% acetic acid

Assistant	Class	Transfer Index 60 min
Anthomine	11	70/14
Cerfax 1300	9A	90/8
Triton X-100	9A	80/6
Peregal O	9A	70/6
gluconic acid	13C	95/4
control		90/4
NaCl	14	70/4
Na_2SO_4	14	70/4
urea	14	70/4
Tergenol G	4	70/2
Resolin B	2	70/2
Seilopon	4	70/2
Naccanol NR	3	80/1
Ahcowet ANH	2	70/1
Blancol	2	70/1
Nopco 1285	1	70/1

Dyeings were made on yarn in package equipment as follows:

Basic Dye: The yarn was prescoured with 1% owf Triton X-101 and 1% ammonia for 10 minutes at 130°F and rinsed. The dyebath was made up with 1% Brilliant Green Crystals (C I 662), ½% glacial acetic acid, 1% Emulphor ON. Dyeing was continued 30 minutes at 200°F, followed by one hour at 225°F.

Anthraquinone Blue SWF
150% (Pr 12)



Brill Green Crystals
(CI 662)

Figure
Migration Tests

Celanthrene Pure Blue
BRS 400% (Pr 62)

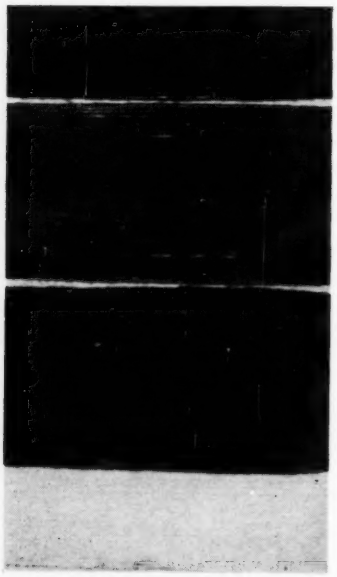


Figure 9
Migration Tests on Orlon

The yarn was rinsed and scoured at 160°F with ½% Duponol RA.

Acid Dye: The yarn was prescoured with 1% Alkanol DW and 1% ammonia owf for 10 minutes at 130°F, followed by rinsing. The dyebath was made up of 2% Antharquinone Blue SWF Conc 150% (Pr 12), ½% Alkanol WXN, ½% sulfuric acid, 4% copper sulfate, and 1.6% hydroxylammonium sulfate. The dyeing was run at 200°F. After dyeing, the yarn

original dyed

5 g/l CELLOMINE POWDER (CLASS 6) MIGRATION AT 250°F

dyed after 60 min (shade much duller)

dyed after 60 min (shade much duller)

2 g/l DECERESOL OTB (CLASS 7) MIGRATION AT 212°F

dyed after 60 min

undyed after 60 min

original dyed

5 g/l ANTHOMINE (CLASS 11) MIGRATION AT 250°F

dyed after 60 min

undyed after 60 min

5 g/l ANTHOMINE (CLASS 11) MIGRATION AT 212°F

dyed after 60 min

undyed after 60 min

original undyed

10
on Orlon

TABLE V-B

BRILLIANT GREEN CRYSTALS (CI 662)

1% basic dye—1 hr at 212° F

		2 g/l Auxiliary			5 g/l Auxiliary		
Assistant	*Class*	*Transfer Index 60 min*	*Rating of Exhaust Solution*	*pH after Trans*	*Migration 60 min*	*Rating of Exhaust Solution*	*pH after Trans*
Anthomine 0.5%, acetic acid	11	80/10	1-2	4.3	80/14	3	4.4
Anthomine	11	80/10	4-5	5.2			
		unlevel					
Cerfak N-100, 0.5% acetic acid	9B	70/14	3	8.1	70/2	4	8.8
Alkamine C-100, 0.5% acetic acid	9B	70/5	3	8.5	70/2	4	9.0
control, 0.5% acetic acid		90/4	5	4.5	90/4	5	4.5
Versene, pH 4.5	13B	80/2	1-2	4.7	80/4	1-2	4.6
			yellow			yellow	4.6
Cellomine Pdr, pH 4.5	6	80/2	4	4.5	80/2	5	4.7

Ratings of Exhaust Solutions
1—Water white
2—Pale
3—Medium
4—Heavy
5—Very heavy

TABLE V-C

BRILLIANT GREEN CRYSTALS (CI 662)

1% basic dye, 1 hr at 250° F

		2 g/l Auxiliary			5 g/l Auxiliary		
Assistant	*Class*	*Transfer Index 60 min*	*Rating of Exhaust Solution*	*pH after Trans*	*Transfer Index 60 min*	*Rating of Exhaust Solution*	*pH after Trans*
Cerfak N-100, pH 4.5	9B	75/25	2	4.7			
Alkamine C-100, pH 4.5	9B	80/20	2	4.6			
Anthromine, 0.5% acetic acid	11	75/25	1-2	4.3	70/35	3-4	4.4
Cerfak N-100, 0.5% acetic acid	9B	70/30	4	8.1	45/12	4	8.8
Anthomine, no acetic acid	11	75/25	4-5	5.2			
			unlevel				
Alkamine C-100, 0.5% acetic acid	9B	60/25	4	8.5	60/6	4	9.0
Neovadine A, 0.5% acetic acid	9A	70/20	2	6.0	60/18	1	7.0
Triton X-100, 0.5% acetic acid	9A	70/16	2-3	4.6	70/18	3	4.5
			yel'ow			yellow	
Cellomine Pdr, pH 4.5	6	70/16	4	4.5	70/14	5	4.5
Maypon K, 0.5% acetic acid	5	70/15	3	5.3	70/8	3-4	6.0
Versene, pH 4.5	13B	80/14	1-2	4.7	80/14	1-2	4.6
Sandopan TFL, 0.5% acetic acid	4	80/14	2	4.9	80/13	2	5.1
control, 0.5% acetic acid		80/14	5	4.5	80/14	5	4.5
Decerosol OT, 0.5% acetic acid	7	70/14	2	4.8	70/14	3-4	5.0
Cellomine Pdr, 0.5% acetic acid	6	70/14	4	7.5	70/10	3-4	7.2
			v yell			v yell	
Alkanol B, 0.5% acetic acid	2	70/12	2	4.5	70/12	3	4.7
Alkanol WXN	3	70/12	2	4.5	75/12	3	4.7
Duponol D	8A	60/9	4	4.5	55/2	4	4.8
Versene	13B	70/3	1	6.9	35/4	1-2	9.0
turkey red oil	10	60/2	4	4.8	50/1	4	5.1

TABLE V-D

CELANTHRENE PURE BLUE BRS 400% (Pr 62)

Disperse dye at 205° F

		Transfer Index 2 g/l Auxiliary		Transfer Index 5 g/l Auxiliary	
Assistant	*Class*	*60 min*	*120 min*	*60 min*	*120 min*
Neovadine A	9A	50/25	41/30	50/25	50/23
control, water		50/20	50/20	50/20	50/20
Hartopon B	8A	50/20	41/27	50/20	41/23
Sandopan TFL	4	50/17	47/20	50/13	41/23
sulfated oils	10	50/17	41/27	50/17	40/27
Cellomine Pdr D	6	50/13	41/20	50/13	41/17
Nekal BX	2	59/11	50/27	53/13 dull	50/23 dull

TABLE V-E

CELANTHRENE PURE BLUE BRS 400% (Pr 62)

Disperse Dye at 250° F

Assistant	Class	2 g/l Auxiliary: * Transfer Index 60 min	2 g/l Auxiliary: Rating of Exhaust Solution	2 g/l Auxiliary: pH after Trans	5 g/l Auxiliary: * Transfer Index 60 min	5 g/l Auxiliary: Rating of Exhaust Solution	5 g/l Auxiliary: pH after Trans
control		30/23	3	6.2	30/23	3	6.2
Sandopan TFL	4	30/23	3	6.3	27/20	3-4	7.0
Decerosol OT	7	30/23	4	6.9	30/20	3	6.9
Duponol D	8A	27/23	4	6.8	27/17	4	5.4
Alkanol WXN	3	30/20	3	7.0	27/20	4	7.0
Alkanol B	2	30/20	4	6.3	33/20	4	7.2
Parapon SA	1	30/20	4	7.0	30/20	4	7.0
Versene	13B	30/20	4	9.1	30/20	3	9.9
Triton X-100	9A	30/20	4-5	6.7	30/23	3-4	6.4
turkey red oil	10	27/20	3	6.1	27/17	4-5	6.6
Maypon K	5	27/20	4	6.9	27/20	4-5	7.5
Neovadine A	9A	30/18	3-4	7.5	27/20	4	8.3
Cellomine Pdr	6	27/17	5	7.1	27/18	5	7.7

* Shades were appreciably to considerably duller.

was rinsed and scoured at 160°F with ½% Duponol RA.

Disperse Dye: The yarn was scoured with 1% Duponol RA and 1% ammonia owf for 10 minutes and then rinsed. It was dyed with 3% Celanthrene Pure Blue BRS 400% (Pr 62) and 0.25% Duponol RA. The yarn was dyed for 20 minutes at 200°F and for 1.5 hours at 250° F. After dyeing, the yarn was rinsed and scoured at 160°F with ½% Duponol RA.

TESTING PROCEDURE——

Basic Dyes: A dyed skein and an undyed skein were treated at a 1:40 fiber-to-bath ratio with 0.5% acetic acid owf or otherwise at the boil for ½ hour in the presence of 2 g and 5 g/liter of auxiliaries as indicated in the table.

Disperse Dye: The tests were made as in previous section without acetic acid.

TABLE V-F

ANTHRAQUINONE BLUE SWF CONC 150% (Pr 12)

Acid Dye, 1 Hour at 212° F

Assistant	Class	2 g/l Auxiliary: * Transfer Index 60 min	2 g/l Auxiliary: Rating of Exhaust Solution	2 g/l Auxiliary: pH after Trans	5 g/l Auxiliary: * Transfer Index 60 min	5 g/l Auxiliary: Rating of Exhaust Solution	5 g/l Auxiliary: pH after Trans
Decerosol OT	7	80/15 unlevel	2	2.7	75/10 v unlevel	3	3.5
Alkamine C-100	9B	90/10	1-2	2.9	87/10	3	3.0
Duponol D	8A	87/10	1-2	2.5	87/10	2-3	2.5
Cerfak N-100	9B	87/10	2	2.8	87/8	3	3.0
Sandopan TFL	4	92/9	1	2.7	87/10 green & dull	1	2.7
Maypon K	5	92/9	1	2.9	87/10 v dull	1-2	3.7
turkey red oil	10	92/9	1	2.7	87/10	1	2.9
Triton X-100	9A	90/9	1	2.6	87/9	1	2.8
Anthomine	11	87/9	4-5	2.6	87/8	3	2.9
Alkanol WXN	3	92/8	1	2.5	87/8	2	2.5
Parapon SA	1	92/8	1	2.5	87/9	1	2.7
Versene**	13B	90/8	2	2.9	87/10	4	3.0
control		92/7	1	2.7	92/6	1	2.7
Alkanol B	2	92/5	1	2.5	87/5	2	2.3
Cellomine Pdr**	6	90/5	1	2.9	95/5	1	3.2
Neovadine A**	9A	75/2	4	3.1	80/1 decomposed	3-4	5.0

* Shades are appreciably to considerably duller.
** pH adjusted.

Acid Dye: For tests at 212°F, an undyed skein was equilibrated with 4% copper sulfate crystals and 1.6% hydroxylammonium sulfate for 45 minutes at the boil. The leveling test was made with dyed skein of equal weight to which was added 2.5% copper sulfate crystals and 1% hydroxylammonium sulfate. The skeins and the treating baths were combined and adjusted to a 1:40 goods-to-bath ratio.

The testing under pressure was done at 250°F with the use of the same conditions as above with the substitution of sodium bisulfite in the amount of 25% of the copper sulfate used instead of hydroxylammonia sulfate.

DISCUSSION AND CONCLUSION—

Basic Dye: Anthomine (Class 11) at 205°F with 0.5% acetic acid shows the best transfer value coupled with the least desorption at the boil. (Table V-B, Figure 10).

Although Cerfax N-100 (Class 9 B, Table V-B) is useful, much desorbed color was left in the dyebath. At 250°F, Cerfax N-100 (Class 9 B, Graph 33) was the best assistant, being very useful at 2 g/liter. The best results were at a pH of about 4.5.

Disperse Dye: At 212°F, Neovadine A (Class 9 A) was outstanding in one hour at 2 g/liter at 250°F. No auxiliary at 2 g/liter gave better migration over the control in distilled water (shade duller). Figure 9 illustrates tests with Nekal BX (Class 2).

Acid Dye: At 212°F, Deceresol OT (Class 7, Graph 35 and Figure 10) and Alkamine C-100 (Class 9 B) showed best transfer. At 2 g/liter at 250°F, Maypon K (Class 5) and Cellomine Power (Class 6, Graph 37) were outstanding.

Tables show experiments on the basic dye at the temperature ranges of 205, 212, and 250°F, on the disperse dye at 205 and 250°F, and on the acid dye at 212 and 250°F.

COTTON

EXPERIMENTAL ——— In selecting dyes for leveling experiments on cotton, consideration was given to the ease of leveling certain classes of dyes, such as direct, developed, and after-treated types. Naphthol dyes were considered impossible to level after coupling, and, as is well known, chemical stripping is neither costly nor deleterious to the fiber if such a course is indicated to correct an uneven dyeing. Sulfur-type dyes were not included in this study because of their decreasing usage. Therefore, only one difficult-to-level substantive dye was selected,

and the remainder of the experiments were devoted to the three temperature classes of anthraquinone vat dyes.

The original dyeings were made on 8/2 combed cotton yarn on packages and included the following dyestuffs:

1) (a) IK colors (cold dyeing type), Vat Orange RK (Pr 116)
   (b) IW colors (warm dyeing type), Vat Yellow PGA (C I none)
   (c) IN colors (hot dyeing type), Vat Olive T (C I none)
   (d) IN colors (hot dyeing type), Vat Jade Green (C I 110)
2) Substantive dyeing type, Fastusol Gray LVGL (Pr 379)

TEST PROCEDURE———The Cotton Committee originally planned that all tests on vat dyes be made at three temperatures, namely, 160, 180, and 200°F, for 30 minutes or 60 minutes, plus an additional set of tests adding 20% anhydrous sodium sulfate at 15 minutes and 30 minutes. Early indications were that the IW and IN colors on the 160°F test migration showed so poorly in comparison with the higher temperatures that they could be eliminated.

In the case of the IK colors, the high

TABLE V-G

ANTHRAQUINONE BLUE SWF CONC 150% (Pr 12)

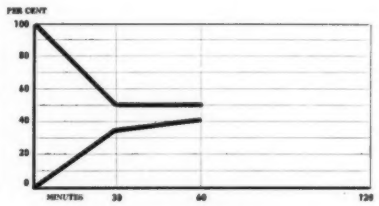
Acid Dye, 1 Hour at 250° F

		2 g/l Auxiliary			5 g/l Auxiliary		
Assistant	*Class*	** Transfer Index 60 min*	*Rating of Exhaust Solution*	*pH after Trans*	** Transfer Ind' x 60 min*	*Rating of Exhaust Solution*	*pH after Trans*
Cellomine Pdr**	6	50/25			62/40	1	2.9
Maypon K	5	50/25	2-3	3.9	50/25 dull	3	4.5
Sandopan TFL	4	40/20	3-4	3.4	35/10	4	3.9
Alkamine C-100	9A	40/20	4-5	2.9	35/10	4	3.0
Cerfak N-100	9A	40/20	4-5	2.9	20/15	4-5	3.3
Anthomine	11	35/20		3.5	35/15	4-5	3.5
Duponol D	8A	35/15	4	3.2	35/15	4-5	3.3
Parapon SA	1	40/10 redder	4	3.4	35/10	4	3.6
turkey red oil	10	35/10	4	3.8	40/15 dull	3-4	4.2
Versene**	13B	35/10	5	2.8	15/5 gray	5	2.9
Alkanol WXN	3	30/10	4	3.3	35/8	4	3.5
Decerosol OT	7	30/10	4	4.0	35/10	4	4.5
Triton X-100	9A	30/10 green dull	4	3.4	35/10	4	3.5
Neovadine A	9A	30/10	4	5.0	decomposed	4-5	
Alkanol B	2	35/8	4	3.5	35/8	4	3.6
control		30/6	4	3.5	30/6	4	3.5

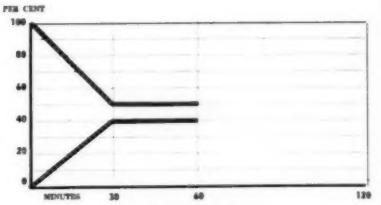
* Shades are appreciably to considerably duller.
** pH adjusted.

MIGRATIONS ON COTTON

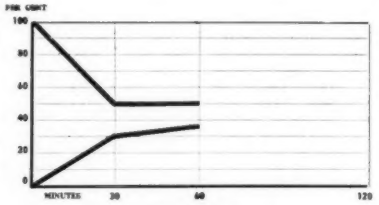
(Upper lines indicate percentages on dyed fiber; lower lines, undyed fiber)



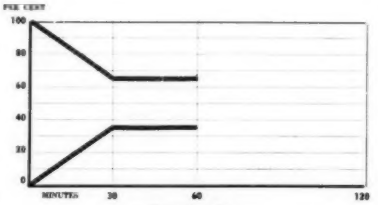
Graph 39
(See Table VI, test 11)



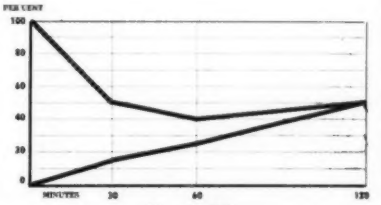
Graph 44
(See Table VI, test 29)



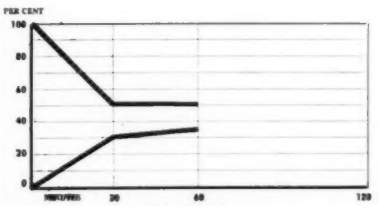
Graph 40
(See Table VI, test 1)



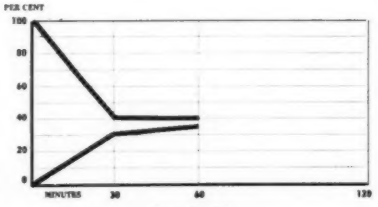
Graph 42
(See Table VI, test 14)



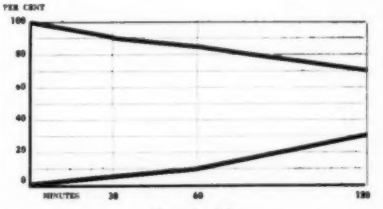
Graph 45
(See Table VI, test 51)



Graph 41
(See Table VI, test 23)



Graph 43
(See Table VI, test 35)



Graph 46
(See Table VI, test 36)

temperatures were decidedly detrimental, causing great loss of strength and change of shade. Tests were then conducted at 100 and 120°F for 30 and 60 minutes. whereas all other migration tests were made up to 120 minutes breakdown of the hydrosulfite in 60 minutes limited these tests to that time.

Vat-color transfer tests were made as follows: To each beaker was added auxiliary, caustic soda at 2 oz per gallon, and hydrosulfite at 2 oz per gal. One dyed and one undyed 5-gram skein were added to a bath with a liquor ratio of 1:20 and with temperature, time and salt additions as indicated.

The direct-dye tests were made with one 5-gram dyed skein and one 5-gram undyed skein at 210°F for 30, 60, and 120 minutes in a bath with a goods-to-liquor ratio of 1:20.

DISCUSSION AND CONCLUSIONS ———The migration results with vat colors showed best transfer with the addition of anhydrous sodium sulfate at ½ time of each experiment. It was also noted that approximately as much transfer occurred in 30 minutes as in 60 minutes. However, 60-minute migration periods are shown to permit reabsorption of color with addition of salt. The following summarized the best leveling results on the vat dyes:

Ink Colors
Vat Orange RK (Pr 116)
⅛ g/gal Hartopon B (Class 8A)
¼ g/gal Nullipon BF 13 (Class 13B, Graph 39)

These two tests were rated at 50/40 and 55/45 respectively, or a little better than the control which was rated 50/35 (Tests 1, 7 and 11 in Table VI). Albatex POK (Class 11) is also illustrated in Figure 12.

IN Color Vat Jade Green (C I 1101): In the case of this dyestuff, no auxiliaries showed better than that obtained in the control made without auxiliary (Graphs 43 and 44). Nekal NS (Class 7) is illustrated in Figure 11.

IN Color Vat Olive T (C I none): This particular color, which is known to be poor in transfer, showed best results at the highest temperature with Peregal OK (Class 11, Graph 41). Protectol III (Class 6) is illustrated in Figure 11.

IW Color Vat Yellow PGA (C I None): This dyestuff showed good leveling in the control bath, and auxiliaries had little or no effect in increasing transfer.

All migration tests on the vat dyes indicate that auxiliaries are of small benefit in leveling. Those auxiliaries that are usually considered beneficial in vat dyeing are shown in the graphs and figures. Applying a fresh bath with caustic soda and hydrosulfite and sufficient additional dyestuff to return to the desired shade permits an additional migration period for leveling not permissible in the original bath because of exhaustion of the hydrosulfite reducing action. The original bath also contains a high electrolyte content of salt, caustic soda, and oxidation products from the hydrosulfite, to which the addition of more caustic soda and hydrosulfite is of little help. The new bath with lower initial electrolyte content permits better description and later readsorption. There is some indication that products, such as Neovadine A, Peregal O, Peregal OK, Albatex POK, are helpful in desorbing a vat dyeing and can be considered beneficial in leveling.

With regard to direct dyestuffs, Fastusol Grey LVGL (Pr 379) as chosen because of its known poor leveling properties. In fact, so poor was the leveling that the 30-minute test showed so little transfer it was eliminated. The best general transfer on all the tests was obtained with an initial period without salt, then adding the salt at ½ time of the migration test.

A review of Table VI, Tests 36 to 53, will show best results were obtained with soap, soda ash and Nullapon B-13 (Figure 12) Since all of these products are alkaline or adjusted to a high pH value, the question of pH effect on this dyestuff was raised. Migration tests were made at pH 6

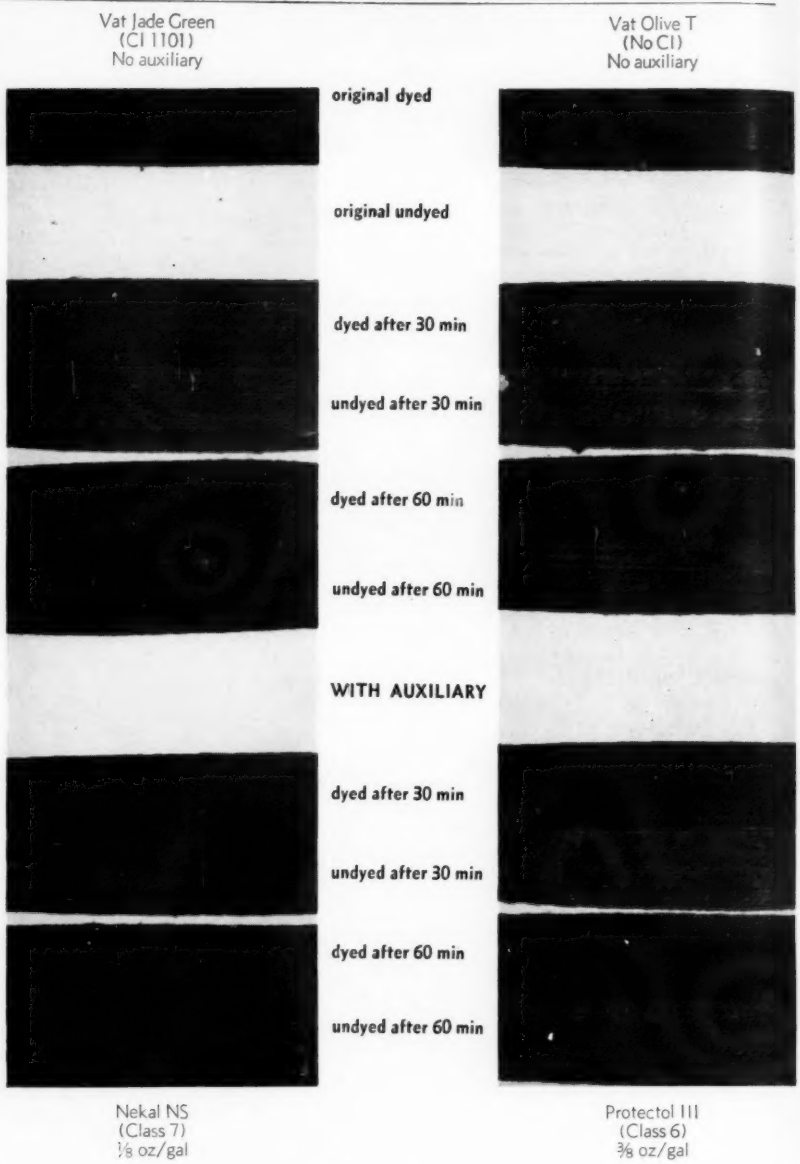


Figure 11
Migration Tests on Cotton (200°F)

TABLE VI
COTTON

Salt is 20% anhyd sodium sulfate owf.
All Transfer Indexes after 60 minutes.

Test No.	Oz per gal	Auxiliary	Class	No Salt 100°F	With Salt 100°F	No Salt 120°F	With Salt 120°F
VAT ORANGE RK (Pr 116)							
1		none	—	55/30	60/40	45/30	50/35
2	⅛	Parapen SA	1	55/30	65/35	45/35	50/40
3	1/16	Igepon T-33	4	55/35	55/40	45/35	50/40
4	⅛	Maypen K	5	60/35	55/35	40/30	50/35
5	1/32	Deceresol OTB	7	55/30	55/35	45/30	50/35
6	⅛	Nekal	7	50/35	55/45	50/40	50/40
7	⅛	Hartopen B	8a	60/40	60/40	45/35	50/40
8	¼	Peregal O	9a	45/30	55/35	40/30	50/35
9	⅛	Peregal OK	11	45/30	55/35	40/30	50/40
10	¼	Albatex POK	11	50/30	60/25	50/30	50/35
11	¼	Nullapon BF-13	13	65/35	60/40	55/40	50/40
12	¼	Neovadine A	9a	40/25	45/25	40/35	40/25
13	3/16	Peregal ST	15	40/25	50/25	40/25	40/25
VAT OLIVE T (CI none)							
14	0	none	—	60/35	60/35	60/35	65/35
15	⅛	Parapon SA	1	70/30	70/30	65/35	65/30
16	1/16	Igepon T-33	4	60/35	65/30	65/30	65/30
17	⅛	Maypon K	5	65/30	65/35	50/35	60/35
18	1/32	Deceresol OBT	7	65/30	70/30	60/30	65/35
19	⅛	Nekal NS	7	70/30	70/30	65/30	65/35
20	⅛	Hartopon B	8a	65/30	65/30	65/30	65/30
21	¼	Peregal O	9a	60/25	60/25	45/35	50/35
22	½	Peregal O	9a	45/30	50/35	50/35	45/30
23	⅛	Peregal OK	11	60/30	60/30	50/30	50/35
24	¼	Albatex POK	11	60/30	60/30	50/30	60/35
25	¼	Nullapon BF-13	13	65/30	70/30	65/35	65/30
26	¼	Neovadine A	9a	30/15	35/15	35/15	35/15
27	3/16	Peregal ST	15	35/20	40/15	40/20	40/20
28	⅛	Protectol 3	6	65/30	65/35	60/35	60/30
VAT JADE GREEN (CI 1101)							
29	0	none	—	50/40	50/40	50/40	50/40
30	⅛	Nekal NS	7	45/35	45/35	45/30	40/30
31	¼	Peregal O	9a	50/30	50/20	45/35	45/35
32	⅛	Peregal OK	11	50/35	50/35	45/30	45/30
33	¼	Albatex POK	11	55/35	55/35	45/30	45/30
34	¼	Neovadine A	9a	15/10	20/10	20/10	25/15
35	⅛	Protectol 3	6	40/30	40/30	40/30	40/35

Test No.	Oz per gal	Auxiliary	Class	No Salt 180°F	With Salt 180°F	No Salt 200°F	With Salt 200°F
29	0	none	—	50/40	50/40	50/40	50/40
30	⅛	Nekal NS	7	45/35	45/35	45/30	40/30
31	¼	Peregal O	9a	50/30	50/20	45/35	45/35
32	⅛	Peregal OK	11	50/35	50/35	45/30	45/30
33	¼	Albatex POK	11	55/35	55/35	45/30	45/30
34	¼	Neovadine A	9a	15/10	20/10	20/10	25/15
35	⅛	Protectol 3	6	40/30	40/30	40/30	40/35

FASTUSOL GREY LVGL (Pr 379)
Anhyd sodium sulfate added at half-time migration.

Test No.	Oz per gal	Auxiliary	Class	Transfer Index After 30 min	Transfer Index After 60 min	Transfer Index After 120 min
36	0	none	—	90/5	85/10	70/30
37	¼	Exite 24	1	—	65/35	60/40
38	¼	Invadine B	2	80/15	80/15	75/25
39	½	Solvadine G	3	65/35	65/35	65/35
40	1/16	Igepon T-33	4	70/25	70/25	60/35
41	¼	Albatex WS	2	70/20	65/25	60/40
42	⅛	Protectol 3	6	95/2	90/5	90/5
43	⅛	Nekal NS	7	70/25	65/35	65/35
44	⅛	Duponol RA	8a	70/25	60/30	60/35
45	⅛	Antifoam EV	9a	80/20	75/25	70/30
46	¼	Levelene 6	10	—	65/35	60/40
47	¼	Ricinole	10	—	60/40	60/40
48	½	Albatex POK	11	80/20	70/30	65/35
49	¼	Low Titre Soap	12	65/35	60/40	55/45
50	¼	High Titre Soap	12	65/35	60/40	50/40
51		Nullapon B 2% owf	13	60/40	55/45	50/50
52		soda ash 20% owf	14	65/30	65/35	55/45
53	1/16	Neovadine A	9a	80/20	75/25	65/30

(adjusted with acetic acid) and pH 12 (adjusted with caustic soda) without an auxiliary. Twenty percent anhydrous sodium sulfite was added at half time. The results were as follows:

	Transfer Index at 60 min	Transfer Index at 120 min
pH 6	90/5	85/10
pH 12	55/45	50/50

Nullapon B-13 was adjusted to pH 6 with acetic acid with the same results of poor migration observed with no auxiliary at pH 6. It became obvious that good leveling of Fastusol Grey LVGL specifically was attained at high pH values.

Because most direct dyestuffs are easily stripped, when uneven, without damage to the cellulose fiber, the experiments on that class of dyes were not considered important and were started late. Further work in time for publication was impossible. The few experiments are shown in the Tables, and the auxiliaries used have probably influenced migration through their effect on the pH of the bath. At the time of the experiments, pH values were not considered important in the migration of this class of dyestuffs, so that none appear in the tables.

It would be a false premise to consider pH the most important factor in controlling the migration of direct dyes. Some dyestuff manufacturers' pattern cards recommend the use of soda ash. However, its use is advocated for correction of hardness in water. Others have pointed out the advantage of ammonium sulfate as a complete or partial substitute for salt. The literature indicated better leveling in addition to preventing decomposition of those direct dyes that are sensitive to higher pH values.

The most important factor influencing migration is the salt or electrolyte sensitivity of each individual direct and vat dyestuff. Benzo Fast Yellow RL (C I 349-A) and Diazo Brilliant Scarlet ROA (Pr 80) are examples of these two extremes in direct dyestuffs. If migration systems are set up with salt concentrations in distilled water as the variable from no salt to 32% NaCl owf, it will be found the Transfer Indexes are approximately the following:

% Salt owf in Distilled Water	Benzo Fast Yellow RL	Diazo Brilliant Scarlet ROA
0	15/0	30/25
1	25/5	40/40
2	30/10	50/40
4	35/20	65/25
8	40/40	75/15
16	55/35	85/10
32	65/30	98/2

In low salt concentrations the Yellow is desorbed but little dye is transferred to the undyed skein. Optimum leveling occurs at a fairly high salt concentration.

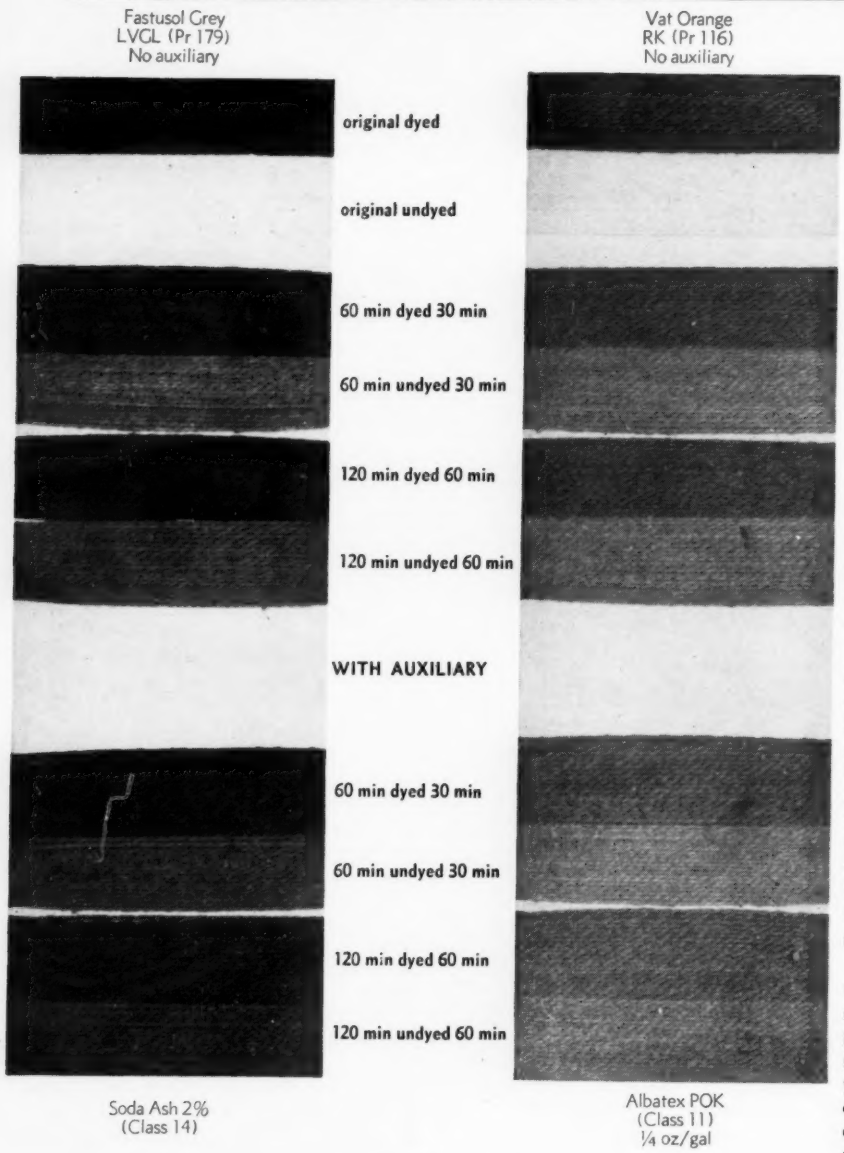


Figure 12
Migration Tests on Cotton (210°F)

Above this optimum point migration is suppressed by high electrolyte. However, the Scarlet is extremely sensitive to salt and best migration is obtained with little or no salt in the bath.

Every direct and vat dyestuff has an optimum salt concentration for best transfer, and a dyer's acquaintance with that property of the individual dye used is most helpful in leveling.

DACRON

EXPERIMENTAL———Dacron polyester fiber is readily dyeable with only one class of dyestuff, vis, disperse (acetate) dyes *(18)*. However, for maximum color efficiency and fastness, it is necessary to employ a carrier for dyeing under atmospheric conditions. The alternative to the use of carriers, pressure dyeing at 250°F, is not covered in this study, since many of the data for normal atmospheric-pressure dyeing should apply for pressure dyeing as well.

Although the leveling of uneven dyeings has been a serious problem, particularly with yarn and piece goods, no known previous study has been conducted to determine the effect of auxiliaries in conjunction with a carrier, the latter being necessary for desorption and re-absorption.

Certain carriers are known to be better for leveling than others. For example, monochlorobenzene is very effective in a closed system, and benzoic and salicylic acids have proved successful in many instances for piece-goods dyeing.

In selecting dyes for leveling studies on Dacron, Celliton Fast Pink RFD-CF (Pr 370) was chosen to represent dyes that transfer readily on this fiber; Acetamine Fast Yellow 4RL (C I none) and Eastman Fast Blue GLF (C I none), to represent moderate transfer; and Latyl Violet B, to represent poor transfer properties. The original dyeings were carried out at 250°F to avoid the complication of residual carrier in the fiber.

PROCEDURE USED FOR ORIGINAL DYEINGS———Staple yarn was dyed in skein form in a Venango Hosiery Pressure Machine (45 gal capacity) by the following procedure, all percentages being expressed on weight of fiber (owf): The machine was loaded with 44-oz skeins packed in cheesecloth bags (10 skeins per bag). Scouring was carried out at 160°F for 15 minutes with 1.5% Duponol D Paste. The material was then rinsed clear and the machine was refilled with water. The dyestuff (4.0% for all colors except the Latyl Violet B, which was 5.0%) was pasted with 2.0% Alkanol DW and added at 130°F. The temperature was raised to 250°F and held for two hours. After dyeing, an overflow rinse was given, followed by a 15-minute scour at 160°F with 0.6% Duponol D Paste.

Initially, a portion of the undyed yarn was pressure-conditioned in the same manner in a colorless bath, since it was postulated that the pressure treatment might alter the dye receptivity of the yarn. However, migration tests on conditioned versus unconditioned yarn indicated no significant difference in transfer properties, and hence, the conditioning step was omitted.

TEST METHOD ——— The undyed yarn was scoured 15 minutes at 160°F with 1.5% Duponol D Paste. The migration test was then conducted as follows: Three 2½-g dyed skeins and three 2½-g undyed skeins were wet out and entered into a bath with a liquor ratio of 1:30. The bath was brought to the boil and held at boil for two hours. After intervals of 30 and 60 minutes, one dyed and one undyed skein were removed and the bath was adjusted again to a liquor ratio of 1:30. The final skeins were removed after a total of 120 minutes. The skeins were given a light 15-minute rinse at 140°F to remove any loosely adhering color. Where monochlorobenzene was used, the temperature was maintained at 185 in-

stead of 212°F, and the tests were carried out in a Launder-Ometer. In this case, for the sake of convenience, separate jars were used for each time interval.

Since the carrier is a necessary part of the leveling action and the three principal classes of carriers used for dyeing Dacron polyester fiber are the phenylphenols, carboxylic acids and chlorinated hydrocarbons, representative members of each class were included in the test, namely, ortho-phenylphenol (regenerated from the sodium salts), benzoic acid and monochlorobenzene. In addition, a number of other materials having carrier action, but not normally used because of economic or toxicological reasons, were included.

While each carrier was initially used at its optimum concentration for dyeing, in some instances it was necessary to lower this concentration in order to show the effect of the auxiliary.

CONCLUSIONS———From the data presented in the tables, it is concluded that no single class of auxiliaries is more effective than all other classes. In general, however, more products falling under the heading "Long-Chain Alcohol Sulfate" (Class 8A) rated higher than those of any other class.

The most important part of the leveling action is the stripping effectiveness of the carrier along with its ability to promote reabsorption of the dye by the undyed fiber. The importance of using the sufficient optimum quantity of carrier in the bath is apparent in these tests. The leveling data obtained with the various carriers are discussed below:

A) Monochlorobenzene———The best leveling was obtained with the optimum dyeing concentration, i e, 20 grams per liter, and with all the dyes in the test the leveling was good. The poorest was with Latyl Violet B and Eastman Fast Blue GLF (Figure 14).

By lowering the concentration to 10 grams per liter and adding 5 grams per liter of certain auxiliaries, the transfer was essentially equal to that obtained with the higher concentration. Best results were obtained with Chlormatic No. 2 and phenylmethylcarbinol (Table VII-A), which are also carriers for dyeing Dacron polyester fiber.

B) Dowicide A———With 5 grams per liter of the sodium salt of orthophenylphenol (Dowicide A regenerated with acetic acid), which with most dyes exhibits very poor transfer properties, the addition of many auxiliaries greatly increased the color migration. Best auxiliaries were Duponol RA (Class 8A, Figure 13), Tamol Liquid (Class 2), and Igepon T Gel (Class 4).

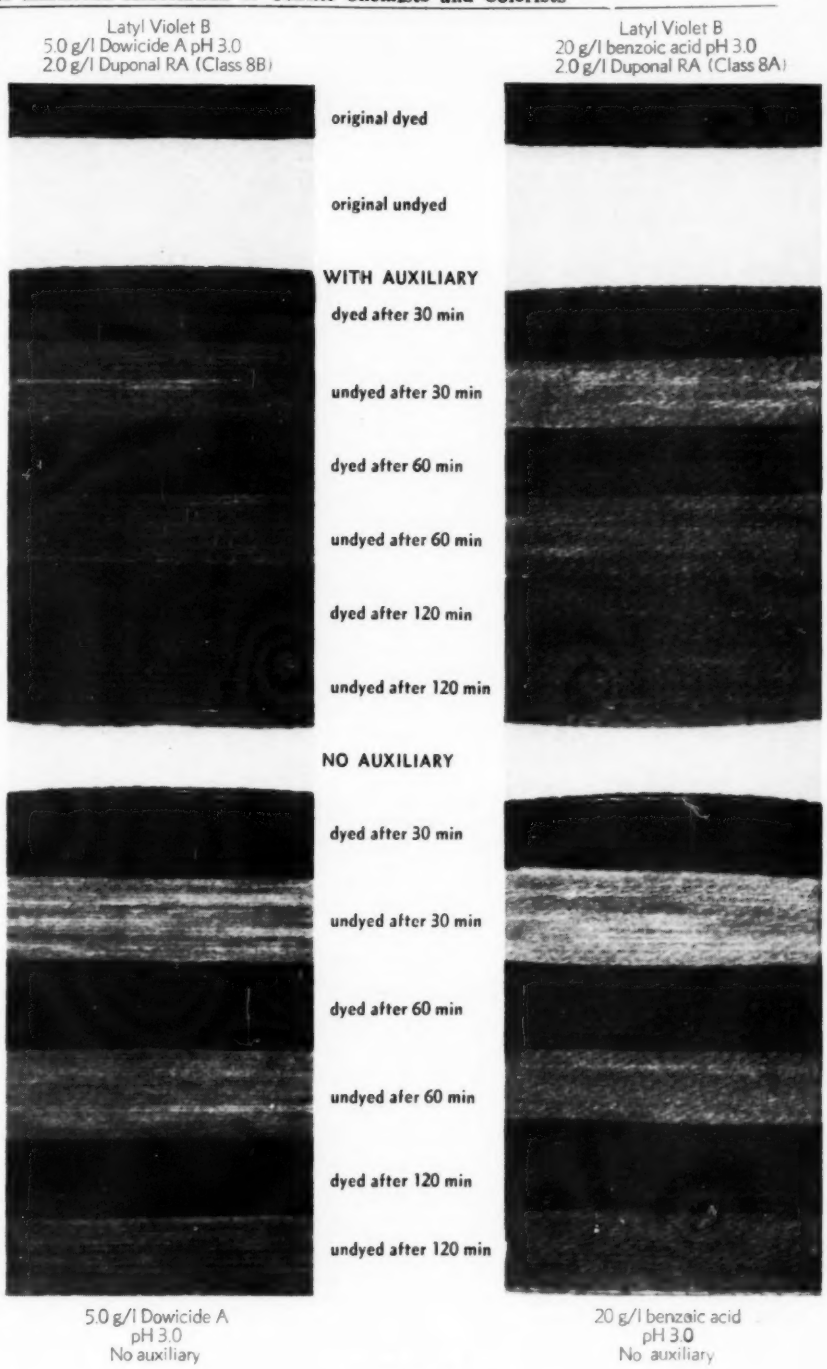


Figure 13
Migration Tests on Dacron (212°F)

In addition to the tests with 5 grams per liter, Dowicide A concentrations of 2.5, 5.0, 7.5, and 10.0 grams per liter were evaluated with all of the dyed with and without auxiliary, to determine the effect of carrier concentration (Table VII-E). In all cases, better transfer was obtained with increasing concentration of the carrier (Graphs 53, 54). In the case of Celliton Fast Pink RFD, the shade was adversely affected with concentrations above 5 grams per liter. In the table for

TABLE VII-A

DACRON

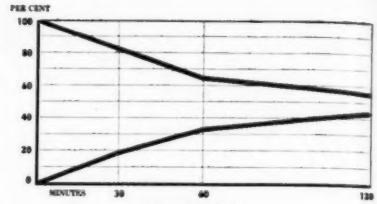
Assistant	Class	g/l	Carrier	g/l	pH	Transfer Index 60 min	Transfer Index 120 min
4.0% EASTMAN FAST BLUE GLF Monochlorobenzene carrier 5 g/l auxiliary							
none			MCB	20.0	7.2	69/32	66/32
none			MCB	10.0	7.2		90/5
Chlormatic No. 2	16		MCB	20.0	6.9		46/41
Phenyl Methyl Carbinol	16		MCB	10.0	7.4		81/11
Nekal NS	7		MCB	10.0	6.9		87/13
Orvus Paste ES	8A		MCB	10.0	7.2		81/8
Prestabit Oil V	10		MCB	10.0	6.2		81/8
Peregal ST	15		MCB	10.0	7.2		81/6
Albatex WS	2		MCB	10.0	9.5		81/5
Nopco 1285	1		MCB	10.0	7.0		81/4
4.0% EASTMAN FAST BLUE GLF 20.0 g/l benzoic acid carrier 2 g/l auxiliary pH 3.0							
none			benzoic acid			69/31	63/37
Tamol Liquid	2		benzoic acid			69/31	56/38
Alkanol DW	3		benzoic acid			75/25	56/38
Nopco ISO	11		benzoic acid			66/25	56/34
Tween 60	9A		benzoic acid			69/16	56/32
Neovadine A High Conc	9A		benzoic acid			69/13	50/25
Calgon	13A		benzoic acid			75/25	69/31
Nekal NS	7		benzoic acid			69/25	63/34
Maypon K	5		benzoic acid			69/25	63/32
Igepon T Gel	4		benzoic acid			69/19	75/25
4.0% EASTMAN FAST BLUE GLF 5.0 g/l Dowicide A carrier 2 g/l auxiliary							
none			Dowicide A		3.0	75/19	63/32
none			Dowicide A		5.0	69/13	75/25
Duponol RA	8A		Dowicide A		3.0	66/32	56/38
Duponol D Paste	8A		Dowicide A		*5.0	63/32	62/38
Duponol RA	8A		Dowicide A		5.0	70/30	62/38
Duponol C	8A		Dowicide A		5.0	50/15	50/25
Tamol Liquid	2		Dowicide A		5.0	63/25	63/32
Duponol D Paste	8A		Dowicide A		3.0	63/25	63/32
Maypon K	5		Dowicide A		*5.0	69/25	56/25
Tamol Liquid	2		Dowicide A		3.0	69/32	66/34
Sandopan TN	15		Dowicide A		*5.0	69/29	66/34
Nekal NS	7		Dowicide A		*5.0	71/25	68/32
Nopco ISO	11		Dowicide A		3.0	75/25	68/32
Igepon T Gel	4		Dowicide A		*5.0	75/25	68/32
Calgon	13A		Dowicide A		5.0	69/19	63/25
Ekaline F	9A		Dowicide A		3.0	81/13	69/25
Sandolan ML	11		Dowicide A		*5.0	75/19	69/25
Alkanol DW	3		Dowicide A		3.0	75/19	68/32
Tween 60	9A		Dowicide A		5.0	75/13	69/19
Nopco ISO	11		Dowicide A		5.0	75/13	69/19
Neovadine A High Conc	9A		Dowicide A		3.0	81/19	71/19
Tween 60	9A		Dowicide A		3.0	81/13	75/19
Ekaline F	9A		Dowicide A		5.0	81/13	81/19
Neovadine A High Conc	9A		Dowicide A		5.0	81/6	75/9

(* pH 3.0 same)

4.0% EASTMAN FAST BLUE GLF Miscellaneous carriers 0.6 g/l auxiliary							
none			phenylmethyl-carbinol	5.0	7.4		96/0
none			Chlormatic No. 2	10.0		56/32	50/44
Sulfonated Castor Oil	10		5-chlorosali-cylic acid	10.0		56/44	50/50
Radiex	15		5-chlorosali-cylic acid	10.0		56/44	50/44
Lathanol LAL	3		5-chlorosali-cylic acid	20.0		69/31	56/44

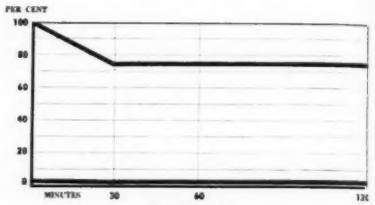
MIGRATIONS

(Upper lines indicate percentages on



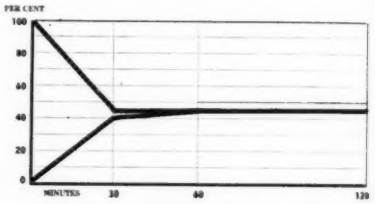
Graph 47

Acetamine Fast Yellow 4RL
5 g/l 3,4-dichlorobenzoic acid
(See Table VII-B)



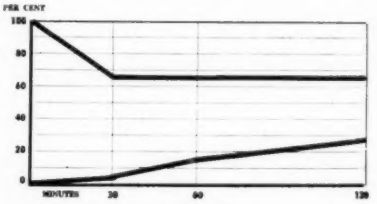
Graph 48

Celliton Fast Pink RFD-CF
10 g/l 3,4-dichlorobenzoic acid
(See Table VII-C)



Graph 49

Latyl Violet B
5 g/l 2,4-dichlorobenzoic acid
2 g/l Duponol RA
(See Table VII-D)



Graph 50

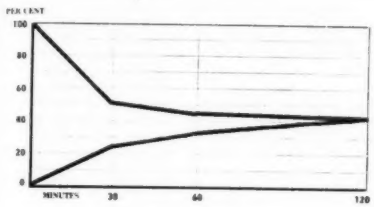
Latyl Violet B
5 g/l 2,4-dichlorobenzoic acid
No assistant
(See Table VII-D)

Latyl Violet B, various concentrations without auxiliary all gave the same transfer value, and in the absence of an auxiliary as a disperser, precipitation of the carrier and tarring of the dyestuff produced extreme unevenness.

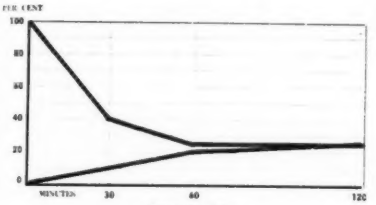
C) Benzoic Acid———With 20 grams of benzoic per liter, transfer was good without auxiliaries. However, the addition of some auxiliaries effected improvement in many cases. The best auxiliaries were Duponol RA (Class 8A, Fig-

ON DACRON

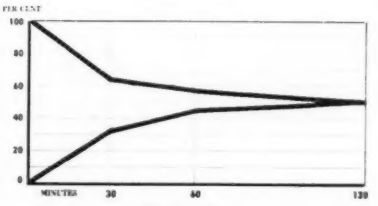
dyed fiber; lower lines, undyed fiber)



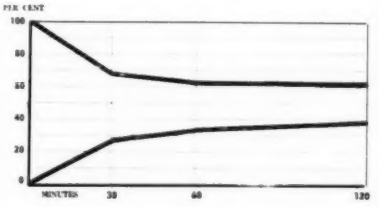
Graph 51
Acetamine Fast Yellow 4RL
10 g/l Chlormatic No. 2
(See Table VII-B)



Graph 52
Latyl Violet B
10 g/l Chlormatic No. 2
(See Table VII-D)



Graph 53
Eastman Fast Blue GLF
7.5 g/l Dowicide A
2 g/l Duponol D Paste
(See Table VII-E)



Graph 54
Eastman Fast Blue GLF
5 g/l Dowicide A
2 g/l Duponol D Paste
(See Table VII-E)

ure 13), Nopco 150 (Class 11), Tomol Liquid (Class 2), Igepon T Gel (Class 4), and Alkanol DW (Class 3).

D) Miscellaneous Carriers———Striking desorption was effected with some dyes by 10-20 grams of Chlormatic No. 2 per liter. The transfer skein at the end of the two-hour cycle was usually very close in strength to the dyed skein, but appreciable dye remained in the bath (Graph 51 and 52). Likewise, 5-10 grams of Chlormatic No. 2 added to 10 grams of

TABLE VII-B

DACRON

Assistant	*Class*	*g/l*	*Carrier*	*g/l*	*pH*	*Transfer Index* 60 min	120 min
4.0% ACETAMINE FAST YELLOW 4RL **Monochlorobenzene carrier**							
none			MCB	20.0	7.2	48/45	50/45
none			MCB	10.0			81/11
Chlormatic No. 2	16	5.0	MCB	10.0	7.0		45/50
Tergitol 7	8B	5.0	MCB	10.0	7.6		53/41
phenylmethylcarbinol	16	5.0	MCB	10.0	7.4	65/32	56/30
Nekal NS	7	5.0	MCB	10.0	6.8		65/35
Quaker TT 3422	2	6.7	MCB	10.0			63/34
Peregal ST	15	5.0	MCB	10.0	7.2		63/28
Albatex WS	2	5.0	MCB	10.0	9.5		65/25
phenylmethylcarbinol	16	2.0	MCB	10.0	7.4		65/25
Nopco ISO	11	5.0	MCB	10.0	8.7		65/8
Surfax No. 1288	7	5.0	MCB	10.0	7.3		80/9
4.0% ACETAMINE FAST YELLOW 4RL **20.0 g/l benzoic acid carrier** **pH 3.0**							
none			benzoic acid			68/32	56/38
Igepon T Gel	4	2.0	benzoic acid			50/44	44/44
Nopco ISO	11	2.0	benzoic acid			44/38	38/38
Calgon	13A	2.0	benzoic acid			62/38	56/44
Nekal NS	7	2.0	benzoic acid			62/38	56/44
Tamol Liquid	2	2.0	benzoic acid			56/38	50/44
Duponol RA	8A	2.0	benzoic acid			56/38	50/41
Maypon K	5	2.0	benzoic acid			56/32	50/41
Alkanol DW	3	2.0	benzoic acid			56/32	44/41
Tween 60	9A	2.0	benzoic acid			50/19	38/25
Neovadine A High Conc	9A	2.0	benzoic acid			38/19	32/19
Chlormatic No. 2	16	20.0	benzoic acid			50/25	50/25
Chlormatic No. 2	16	10.0	benzoic acid			63/6	63/13
4.0% ACETAMINE FAST YELLOW 4RL **5.0 g/l Dowicide A (sodium salt of orthophenylphenol)** **2 g/l auxiliary**							
none			Dowicide A		3.0	75/19	63/25
none			Dowicide A		5.0	63/25	68/32
Duponol RA	8A		Dowicide A		5.0	50/50	50/50
Duponol D Paste	8A		Dowicide A		3.0	50/44	50/48
Duponol D Paste	8A		Dowicide A		5.0	50/44	50/44
	15		Dowicide A		*5.0	56/32	50/44
Duponol C	8A		Dowicide A		5.0	50/32	50/44
Duponol RA	8A		Dowicide A		3.0	50/38	50/44
Sandolan ML	11		Dowicide A		3.0	62/38	56/44
Tamol Liquid	2		Dowicide A		*5.0	56/38	56/44
Nopco ISO	11		Dowicide A		3.0	50/38	50/38
Igepon T Gel	4		Dowicide A		*5.0	40/35	40/35
Alkanol DW	3		Dowicide A		3.0	56/32	50/38
Alkanol DW	3	2.0	Dowicide A		5.0	56/38	56/38
Nekal NS	7	2.0	Dowicide A		*5.0	63/32	56/38
Maypon K	5	2.0	Dowicide A		3.0	63/32	56/38
Neovadine A	9A	2.0	Dowicide A		3.0	56/32	50/32
Emulphor O	9A	0.5	Dowicide A		5.0	56/32	56/34
Emulphor O	9A	0.25	Dowicide A		5.0	62/38	60/40
Calgon	13A	2.0	Dowicide A		5.0	63/25	63/32
Tween 60	9A	2.0	Dowicide A		3.0	63/25	63/32
sulfonated castor oil	10	2.0	Dowicide A		5.0	69/19	63/25
Carolite Base	9B	2.0	Dowicide A		5.0	63/19	50/25
Nopco ISO	11	2.0	Dowicide A		5.0	63/19	56/25
Ekaline F	9A	2.0	Dowicide A		*5.0	69/13	56/19
Sandolan ML	11	2.0	Dowicide A		5.0	87/13	75/25
Emulphor O	9A	2.0	Dowicide A		5.0	63/8	50/10
(* pH 3.0 same)							
4.0% ACETAMINE FAST YELLOW 4RL **Miscellaneous carrier** **No auxiliary**							
Chlormatic No. 2		20.0				38/19	32/25
Chlormatic No. 2		10.0				44/32	41/41
3,4-dichlorobenzoic		5.0				63/32	56/44
2,4-dichlorobenzoic		5.0				75/25	56/38

TABLE VII-C
DACRON

Assistant	Class	g/l	Carrier	g/l	pH	Transfer Index 60 min	Transfer Index 120 min
4.0% CELLITON FAST PINK RFD-CF — Monochlorobenzene carrier							
control			MCB	20.0	7.2	43/43	41/40
control			MCB	10.0			63/8
control			MCB	5.0			75/13
phenylmethylcarbinol	16	5.0	MCB	10.0	7.4		46/44
Quaker TT 3422	2	0.5	MCB	10.0			46/44
Chlormatic No. 2	16	5.0	MCB	10.0	6.9		48/43
Nekal NS	7	5.0	MCB	10.0		50/35	44/36
Alkanol B	2	*5.0	MCB	5.0			69/11
Nopco 1285	1	*2.0	MCB	5.0			69/10
Tergitol 7	8B	*5.0	MCB	5.0			75/13
Neovadine A High Conc	9A	0.4	MCB	5.0			69/10
Orvus Paste ES	8A	*5.0	MCB	5.0			75/10
Surfax No. 1288	7	5.0	MCB	5.0	3.0		63/6
Quaker TT 3422	2	*5.0	MCB	5.0			75/9
Triton X-101	9A	*2.0	MCB	5.0			75/9
Neovadine A High Conc	9A	5.0	MCB	10.0	9.3		71/6
42-titer tallow soap	12	5.0	MCB	10.0	10.2		69/5
Perma Kleer	13B	*2.0	MCB	5.0			81/8
(* Also evaluated at 0.5 g/l with identical results)							
4.0% CELLITON FAST PINK RFD-CF — 20 g/l benzoic acid carrier							
control	8A	2.0	benzoic acid		3.0	56/38	50/44
Duponol RA			benzoic acid		3.0	50/44	50/50
Calgon	13	2.0	benzoic acid		3.0	44/44	44/44
Tamol Liquid	2	2.0	benzoic acid		3.0	44/44	44/44
Nekal NS	7	2.0	benzoic acid		3.0	44/44	44/44
Maypon K	5	2.0	benzoic acid		3.0	44/44	44/44
Nopco ISO	11	2.0	benzoic acid		3.0	44/44	44/44
Igepon T Gel	4	2.0	benzoic acid		3.0	44/44	44/44
Chlormatic No. 2	16	10.0	benzoic acid			38/38	38/38
Chlormatic No. 2	16	5.0	benzoic acid			38/38	38/38
Tween 60	9A	2.0	benzoic acid		3.0	38/38	38/38
soap	12	5.0	benzoic acid			63/19	50/44
4.0% CELLITON FAST PINK RFD-CF — Benzoic acid carrier							
Igegon T Gel	4	10.0	benzoic acid	20.0	3.0	50/32	50/44
Pine Oil	15	10.0	benzoic acid	20.0		56/32	50/44
Alkanol DW	3	2.0	benzoic acid	20.0	3.0	50/44	50/44
Chlormatic No. 2	16	10.0	benzoic acid	10.0		50/25	44/38
Carbolan Salt A	9A	10.0	benzoic acid	20.0		56/25	56/38
sulfuric acid	14	5.0	benzoic acid	20.0		63/25	50/38
Glauber's salt	14	20.0	benzoic acid	20.0		69/31	63/37

Assistant	Class	g/l	Carrier	g/l	pH	Transfer Index 60 min	Transfer Index 120 min
4.0% CELLITON FAST PINK RFD-CF — Benzoic acid carrier							
Igepal CA Extra Conc	9A	5.0	benzoic acid	20.0		56/13	50/25
Nullapon B	13A	10.0	benzoic acid	20.0		69/19	63/32
Neovadine A High Conc	9A	10.0	benzoic acid	20.0	3.0	56/13	50/19
4.0% CELLITON FAST PINK RFD-CF — 5 g/l Dowicide A carrier, 2.0 g/l auxiliary							
control			Dowicide A		3.0	50/44	50/48
control			Dowicide A		5.0	56/44	50/46
Sandopan TN	15		Dowicide A		*5.0	50/44	50/50
Alkanol DW	3		Dowicide A		3.0	46/46	50/50
Calgon	13A		Dowicide A		5.0	50/50	50/50
Nekal NS	7		Dowicide A		3.0	50/50	50/50
Duponol RA	8A		Dowicide A		*5.0	50/46	50/50
Ekaline F	9A		Dowicide A		3.0	56/44	50/48
Tamol Liquid	2		Dowicide A		3.0	44/44	44/44
Duponol C	8A		Dowicide A		5.0	50/44	44/44
Nopco ISO	11		Dowicide A		3.0	44/44	44/44
Maypon K	5		Dowicide A		*5.0	50/44	44/44
Duponol D Paste	8A		Dowicide A		5.0	46/44	44/44
Igepon T Gel	4		Dowicide A		*5.0	44/44	44/44
Duponol D Paste	8A		Dowicide A		3.0	50/44	50/44
Nopco ISO	11		Dowicide A		5.0	50/44	50/44
Sandolan ML	11		Dowicide A		*5.0	50/44	50/44
Alkanol DW	3		Dowicide A		5.0	50/44	50/44
Tamol Liquid	2		Dowicide A		5.0	56/44	50/44
Tween 60	9A		Dowicide A		*5.0	56/38	50/44
Nekal NS	7		Dowicide A		5.0	50/44	50/44
Ekaline F	9A		Dowicide A		5.0	62/38	56/44
Neovadine A High Conc	9A		Dowicide A		3.0	50/38	44/38
sulfonated castor oil 75%	10		Dowicide A		5.0	63/25	50/32
SD No. 50	3		Dowicide A		5.0	63/16	62/38
Carolite Base	9B		Dowicide A		5.0	63/19	63/32
Nonionic 218	9A		Dowicide A		5.0	87/6	87/13
(* pH 3.0 same)							
4.0% CELLITON FAST PINK RFD-CF — Miscellaneous carriers							
Chlormatic No. 2		10.0				44/41	44/44
		20.0				32/25	38/38
phenylmethylcarbinol		20.0				56/19	44/25
2,4-dichlorbenzoic		5.0				63/32	50/44
2,4-dichlorbenzoic		10.0				46/44	46/44
3,4-dichlorbenzoic		10.0				75/0	75/0

TABLE VII-D
DACRON

5.0% LATYL VIOLET B
Monochlorobenzene carrier
5 g/l auxiliary

Assistant	Class	g/l	Carrier	g/l	pH	Transfer Index 60 min	Transfer Index 120 min
none			MCB	20.0	7.2	50/27	40/30
none			MCB	10.0	7.2		60/15
none			MCB	5.0			84/5
Chlormatic No. 2	16		MCB	10.0	6.9	33/14	32/22
phenylmethylcarbinol	16		MCB	10.0	7.4		48/20
Nekal NS	7		MCB	10.0	7.0	50/26	52/23
Tergitol 7	8B		MCB	10.0	7.6		55/16
Quaker TT 3422	2	(0.6 g/l)	MCB	10.0			45/38
Quaker TT 3422	2		MCB	10.0	7.3		50/12
Albatex WS	2		MCB	10.0	9.5		64/16
Peregal ST	15		MCB	10.0	7.2		60/12
42-titer tallow soap	12		MCB	10.0	10.2		50/8
Neovadine A	9A		MCB	10.0	9.4		60/6
Tergitol 7	8B		MCB	5.0	3.0		70/3
Tergitol 7	8B		MCB	5.0	5.0		75/4

5.0% LATYL VIOLET B
20.0 g/l benzoic acid
2 g/l auxiliary
pH 3.0

Assistant	Class	g/l	Carrier	g/l	pH	Transfer Index 60 min	Transfer Index 120 min
none			benzoic acid			60/20	55/30
Nopco ISO	11		benzoic acid			50/40	45/40
Duponol RA	8A		benzoic acid			55/35	50/40
Alkanol DW	3		benzoic acid			60/25	50/40
Calgon	13A		benzoic acid			60/20	50/35
Neovadine A	9A		benzoic acid			55/20	45/25
Maypon K	5		benzoic acid			60/30	55/30
Igepon T Gel	4		benzoic acid			70/25	65/30

5.0% LATYL VIOLET B
5.0 g/l Dowicide A carrier
2 g/l auxiliary

Assistant	Class	g/l	Carrier	g/l	pH	Transfer Index 60 min	Transfer Index 120 min
none			Dowicide A		3.0	65/15	65/20
none			Dowicide A		5.0	80/5	60/5
Duponol RA	8A		Dowicide A		3.0	50/40	45/45
Duponol RA	8A		Dowicide A		5.0	50/40	45/42
Neovadine A High Conc	9A		Dowicide A		3.0	55/35	50/40
Sandopan TN	15		Dowicide A		*5.0	50/30	50/40
Duponol ME Dry	8A		Dowicide A		5.0	50/35	50/40
Duponol D Paste	8A		Dowicide A		5.0	50/35	50/40

5.0% LATYL VIOLET B
5.0 g/l Dowicide A carrier
2 g/l auxiliary

Assistant	Class	g/l	Carrier	g/l	pH	Transfer Index 60 min	Transfer Index 120 min
Duponol C	8A		Dowicide A		5.0	55/30	45/37
Duponol WAQ	8A		Dowicide A		5.0	65/20	53/40
Duponol LS	8A		Dowicide A		5.0	50/35	50/37
Nopco ISO	11		Dowicide A		3.0	50/30	50/30
Tamol Liquid	2		Dowicide A		3.0	60/20	55/30
			(* pH 3.0 same)				

5.0% LATYL VIOLET B
5.0 g/l Dowicide A carrier

Assistant	Class	g/l	Carrier	g/l	pH	Transfer Index 60 min	Transfer Index 120 min
Tween 60	9A	2.0	Dowicide A		5.0	60/20	55/30
Emulphor O	9A	0.5	Dowicide A		5.0	55/30	55/30
Maypon K	5	2.0	Dowicide A		3.0	60/20	57/25
Alkanol DW	3	2.0	Dowicide A		5.0	65/20	60/30
Ekaline F	9A	2.0	Dowicide A		*5.0	65/15	60/25
Sandolan ML	11	2.0	Dowicide A		3.0	65/10	60/25
Tween 60	9A	2.0	Dowicide A		3.0	60/20	60/25
Alkanol DW	3	2.0	Dowicide A		3.0	70/15	60/20
Tergitol TMN	9A	2.0	Dowicide A		5.0	70/18	65/20
Neovadine A	9A	2.0	Dowicide A		5.0	70/6	65/20
Emulphor O	9A	2.0	Dowicide A		5.0	60/10	55/15
Calgon	13A	2.0	Dowicide A		5.0	65/10	60/15
Sandolan ML	11	2.0	Dowicide A		5.0	70/5	65/15
Nopco ISO	11	2.0	Dowicide A		5.0	60/10	60/10
			(* pH 3.0 same)				

5.0% LATYL VIOLET B
Miscellaneous carriers

Assistant	Class	g/l	Carrier	g/l	pH	Transfer Index 60 min	Transfer Index 120 min
none			Chlormatic No. 2	10.0		25/20	25/25
none			Chlormatic No. 2	20.0		20/15	20/20
none			2,4-dichloro-benzoic	5.0	3.0	65/15	55/25
none			2,4-dichloro-benzoic	10.0		50/25	45/35
Duponol RA	8A	2.0	2,4-dichloro-benzoic	5.0	3.0	45/45	45/45
Chlormatic No. 2	16	6.6	5-chlorosalicylic	10.0		55/30	35/30
sulfonated castor oil	10	0.6	5-chlorosalicylic	10.0		55/35	55/35
none			3,4-dichloro-benzoic	5.0		60/15	50/25
Glauber's salt	14	20.0	benzoic acid	20.0		69/31	63/37
			3,4-dichlorbenzoic	10.0			75/0

TABLE VII-E

DACRON

Assistant	Class	g/l	Carrier	g/l	pH	Transfer Index 60 min	Transfer Index 120 min
EFFECT OF DOWICIDE A CONCENTRATION ON LEVELING 4.0% ACETAMINE FAST YELLOW 4RL 2 g/l auxiliary pH 5.0							
none			Dowicide A	2.5		81/19	69/25
none			Dowicide A	5.0		63/25	68/32
none			Dowicide A	7.5		69/30	56/38
none			Dowicide A	10.0		63/32	56/38
Duponol D Paste	8A		Dowicide A	2.5		75/25	69/29
Duponol D Paste	8A		Dowicide A	5.0		50/44	50/48
Duponol D Paste	8A		Dowicide A	7.5		50/46	50/46
Duponol D Paste	8A		Dowicide A	10.0		50/50	50/50
EFFECT OF DOWICIDE A CONCENTRATION ON LEVELING 4.0% EASTMAN FAST BLUE GLF 2 g/l auxiliary pH 5.0							
none			Dowicide A	2.5		87/5	81/6
none			Dowicide A	5.0		69/13	75/25
none			Dowicide A	7.5		69/19	69/19
none			Dowicide A	10.0		75/13	63/32
Duponol D Paste	8A		Dowicide A	2.5		81/9	81/13
Duponol D Paste	8A		Dowicide A	5.0		63/32	62/38
Duponol D Paste	8A		Dowicide A	7.5		56/44	50/50
Duponol D Paste	8A		Dowicide A	10.0		56/44	50/50
EFFECT OF DOWICIDE A CONCENTRATION ON LEVELING 5.0% LATYL VIOLET B 2 g/l auxiliary pH 5.0							
none			Dowicide A	*2.5		80/5	60/5
Duponol D Paste	8A		Dowicide A	2.5		70/15	65/20
Duponol D Paste	8A		Dowicide A	5.0		50/35	50/40
Duponol D Paste	8A		Dowicide A	7.5		50/40	50/44
Duponol D Paste	8A		Dowicide A	10.0		50/37	40/40

(* 5.0, 7.5 and 10.0 g/l all the same)
(Precipitation of Carrier and Tarring of Dyestuff Occurs)

5-chlorosalicylic acid per liter (Figure 14) gave good leveling.

2, 4-and 3, 4-dichlorobenzoic acids exhibited good to poor leveling depending on the dyestuff (Graphs 47 and 48). The addition of Duponol RA (Class 8A) greatly improved the leveling of these two products (Graphs 49 and 50).

GENERAL SUMMARY

Despite the fact the results obtained in this work were derived in an exploratory fashion, there must be reason why certain auxiliaries consistently showed improvement of leveling. An examination of the Tables on wool and nylon shows consistent results in improved migration with Class 9-B Ninol-type nonionic, with Class 11 cationactive agents and with Class 9A nonionic Neovadine A. These two fibers have the same dyeing mechanism with acid dyestuffs.

The most likely reason these agents increase leveling is that they form addition products with the dye molecules, desorbing dye from the material by competition for the dyestuff. At this point reabsorption occurs, the auxiliary apparently acting as a dye reservoir for transfer among the various dye sites.

Valko *(19)* divides leveling agents into two groups:

1) Agents which compete with the dye for dye sites, viz, Glauber's salt in the strongly acid dyeing of wool, and long-chain alcohol sulfates in all wool dyeing, and, with the exception of disperse dyes, in all nylon dyeing. These agents have slight effect on the particle size of the dye.

2) Agents which form addition products with the dye molecule. These are described as electrically neutral, yielding large aggregate particle size. Attention is then called to their use only in cellulose dyeing as retarding agents. Peregal OK of Class 11 produced the highest aggregation factor in the studies.

The question of whether these auxiliaries from Class 9B, 11 and 9A increase particle size or are direct additives, similar to a "liquid fiber" in their reaction to or with the dyestuff, has not been within the scope of these investigations.

An important difference between desorption caused by alkaline baths and these auxiliaries is the ability of the latter not to reduce the affinity of the wool and nylon for the dye to the vetry low level so typical of alkaline desorption. It was observed particularly in the wool experiments that these agents exhibited varying degrees of ionic activity. Whether an assistant was nonionic or strongly cationic, the effect on leveling was at an optimum at a particular pH value dependent upon the normal reaction of the individual dyestuff. No single auxiliary will suffice and must be chosen for each dyestuff class and fiber.

The mechanism of dyeing cellulose is apparently less complex than that of dyeing wool and nylon. This must limit the possibilities of auxiliary assistance considerably. Any improvement or suppression of migration by the various auxiliaries for cellulose could probably be attributed to their individual effect on electrolyte concentration and aggregate particle size, both fundamental factors influencing the migration of dyes on cellulosic fibers.

The reason for any consistent effect of these agents on the acrylic fibers, Dynel, Acrilan and Orlon, is more difficult to explain, mainly because of the newness of these fibers and the existence of few experimental dyeing studies.

Acrilan has a dyeing mechanism somewhat related to wool and nylon, and there were indications that auxiliaries found helpful on those fibers would show benefit in leveling Acrilan. However, all the acrylic fibers, which possess strong resistance to chemical damage, can be subjected to drastic desorption systems that would completely deteriorate fibers like wool. Subsequently, as shown in the Tables, reabsorption with acids, cuprous ion, etc can produce fairly good results.

The mechanism of dyeing Dacron with disperse dyes assisted by carrier action is certainly an innovation and, in comparison with wool, cotton and nylon, has been reported on in very few investigations. Good migration is possible in comparison with the dyeing of acrylic fibers and, from dyehouse production experience, more difficulty is encountered in carrier precipitation and tarring of dyestuffs than in intrinsically poor leveling.

CONCLUSION

The ideal leveling gent would be one which would produce equilibrium or the same shade on a dyed and undyed material in minimum time. According to the results of our experiments, remarkable decreases in leveling time are obtained under certain conditions. These have been sufficient to warrant further studies of the mechanisms involved. Meanwhile, a study of the tables in this paper may

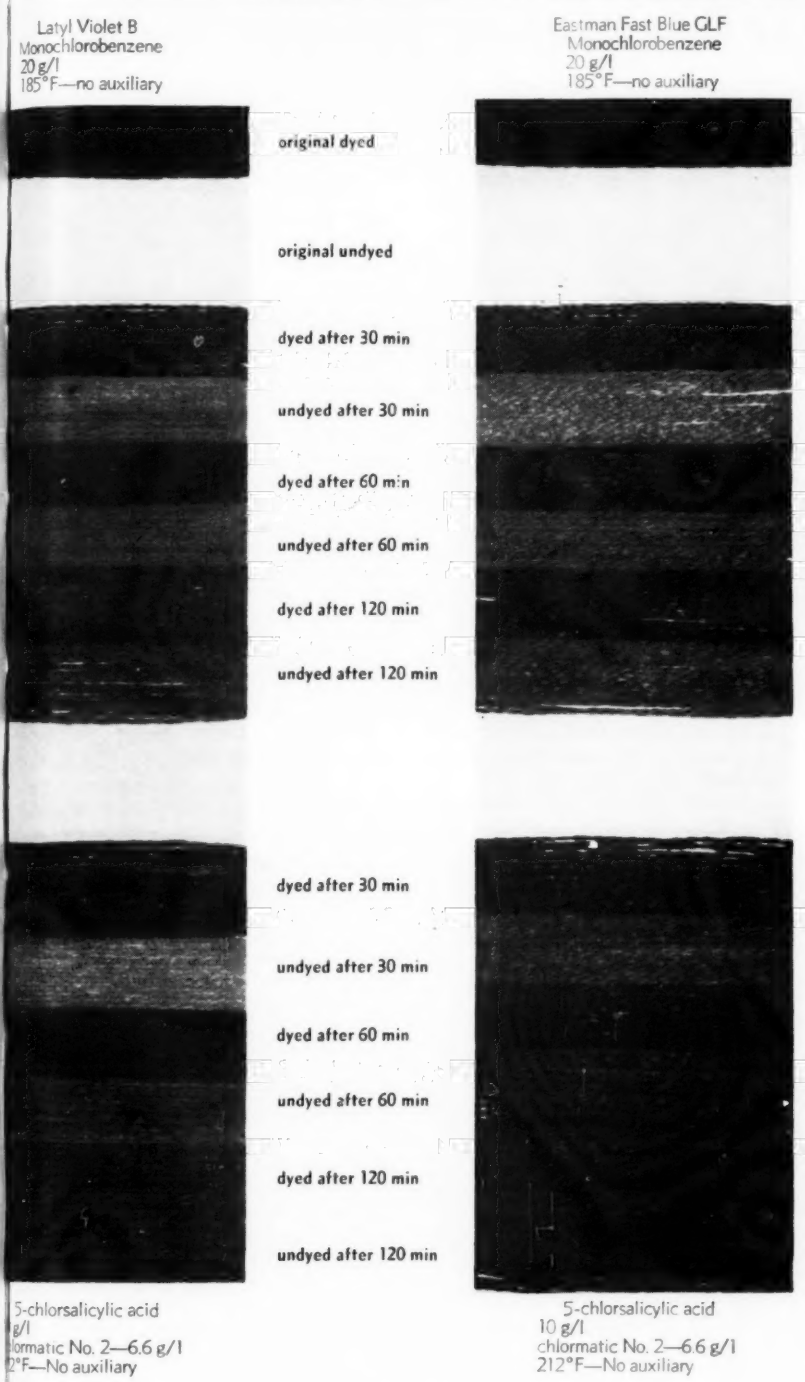


Figure 14
Migration Tests on Dacron

suggest some empirical trials to the practical dyer.

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North American Lace Co
Philadelphia Textile Institute
Royce Chemical Co
Sandoz Chemical Works
Scholler Bros, Inc
Synthron, Inc
Fred Whitaker Co

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(17) Du Pont Co, "Notes on the Dyeing of Orlon Acrylic Fiber", Oct, 1952.

(18) Du Pont Co, "Notes on the Dyeing of Dacron Polyester Fiber", Oct, 1952.

(19) Valko, "Kolloidchemische Grundlagender Textilveredlung", Berlin (1937); *Trans Faraday Soc* 31, 230 (1935); *J Soc Dyers Colourists* 55, 173 (1939); *J Am Chem Soc* 63, 1433 (1941).

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It is presumed that authors in studying the comments of reviewers and of the Editor will remember that all recommendations are made in a kindly, helpful, sympathetic manner to improve the paper in both literary and technical excellence. Although authors should cheerfully consider suggestions, they are expected to defend their position if justified, especially when strictly technical matters are involved with which the authors have an intimate knowledge.

MANUSCRIPTS—Manuscripts shall be typewritten double-spaced with approximately one-inch margins on 8.5 x 11-inch white paper. In addition to the *original*, at least one carbon copy is required. Pages are to be numbered consecutively with Arabic numerals, and each page after the first shall carry the authorship at the very top. Tables and figures shall also be numbered consecutively, the tables with headings containing Roman numerals as TABLE I, TABLE II, etc, and the figures with Arabic numerals as Figure 1, Figure 2, etc, appearing *below* the figures. The names of the authors and their laboratories or business connections should appear below the title of the paper.

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LITERARY STYLE AND FORM OF PRESENTATION—In the writing of papers, authors are requested to observe a trenchant, simple style of writing directed to textile chemists and colorists with at least an elementary knowledge of chemistry, physics, mathematics, engineering, textile processes and textile machinery.

In the organization of the material, there should be one or more introductory paragraphs setting forth the occasion, significance and main objectives of the paper and of the method of attack. This should be followed by the body of the presentation, either with discussions interspersed throughout this portion or with a collected section marked "DISCUSSION" after the main body of the paper. Finally, there may be a brief section at the end entitled "SUMMARY" of "CONCLUSIONS."

Center and side headings make for easier reading. Center headings should be employed sparingly and generally will include only very important section headings, such as "INTRODUCTION," "EXPERIMENTAL," "DISCUSSION," "CONCLUSIONS," "SUMMARY," and "REFERENCES." Side headings (see third paragraph of this *Notice* for an example) shall be indented and run into the text to which they apply, and shall be separated from the paragrpah by a dash. The publisher will print center headings in bold-face capitals and side headings in capitals.

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HIGHLIGHTS OF THE PAST YEAR in dyeing and finishing

P J WOOD

Technical Director, Royce Chemical Co

DYEING

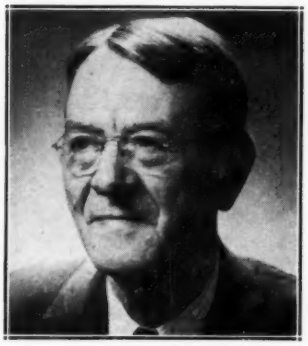
THE tendency toward high-temperature dyeing continues. Many new types of machines have been introduced since this technique was first reported in one of the annual "Highlights". Improvements continue to be made in existing machines of this type, in the light of experience.

One of these is the better means of loading the Barotor open-width high-temperature dyeing machine, developed and introduced to the dyeing industry by DuPont. The new loading device makes it possible to load the goods onto the machine in a practically tensionless state, with minimum creasing of the fabric, low ratio of dye liquor to goods, and uniform treatment of each yard of cloth with the dye liquor. The new machine is also furnished with facilities for quick closure, which avoids the necessity of tightening many nuts.

It is said that, with the new Barotor, acetate sharkskins can be dyed in 4 hours with good penetration and perfect levelness, and without over-stretching, obviously a big improvement over jigger operation.

* * *

Along with the above-noted tendency toward high temperature is the continuation and extension of the search for improved continuous-dyeing methods. A new variation on the theme of continuous vat pad-steam methods is presented in an interpretation of this system by the German machinery firm of Benteler-Werke AG, in which the pigmentation is accomplished by passage through a double-nip padding machine having quite shallow color troughs that impregnate the goods with 84% pickup of the dispersed pigment. From the padder the goods pass directly into the steamer through a trough containing the necessary caustic hydrosulfite mixture, which not only impregnates the cloth, but also acts as a water-seal to impound the steam in the box. A similar trough serves the same purpose at the outgoing end of the steamer. The steam box is provided with idler rollers to conduct the cloth through the steam atmosphere, just as in the regular steam ager, but at five points, including entry and exit, the goods dip into a trough containing the reducing mixture. Grooves or gutters connect these troughs. Water flows on the under-side of the troughs to keep the reducing solution from getting too hot. On emerging from the ager, the goods pass immediately into a "skying" arrangement, which leads them into the first compartment of an eight-box continuous open-width washer, where the usual treatments of rinsing, neutralization, oxidation, washing, soaping and washing are carried out. The pad-steam units can be introduced into the train of any existing open-width washer. The machine is said to run anywhere from 12 to 55 yards a minute. (See Figure 1).



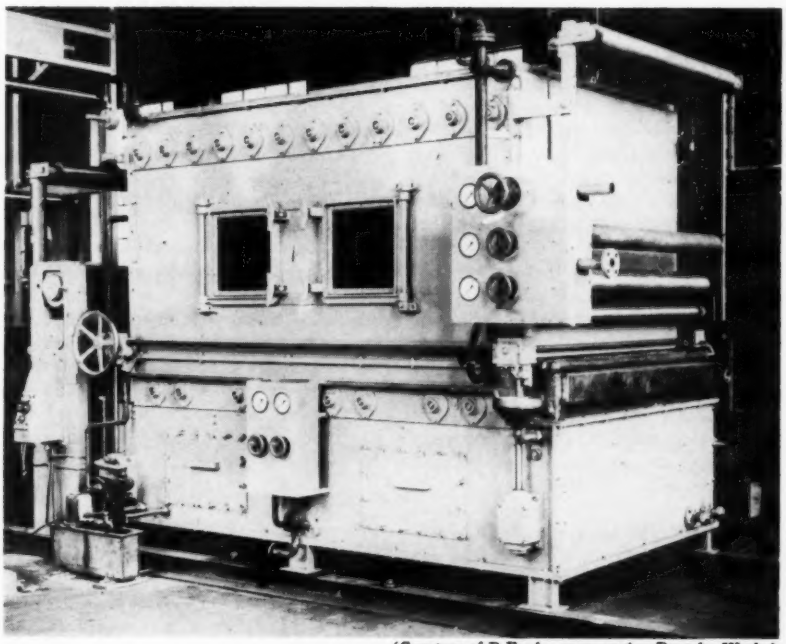
P J Wood

With a redox potentiometer it should be possible to automatically regulate the potential of the reducing agent.

The novel feature of the machine seems to be the repeated exposure to the reducing bath, during the course of the steaming. It is claimed that this makes it possible to use the apparatus for producing medium and dark shades with no side-to-side and end-to-end shading.

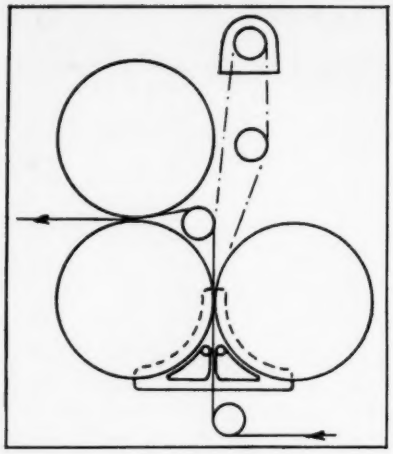
* * *

A new type of padding machine, believed to have been originated by Haubold of Zittau (now in the Russian zone), but now made under license by Maschinenfabrik K Peter, AG, consists of three squeeze rollers, two of which are parallel in the horizontal plane; the third roller is parallel to one of these in the vertical plane. (See Figure 2). The two upper rollers are provided with tightly fitting plates at the ends, that form a receptacle for containing the dye liquor. The goods pass downwards between the top rollers, going through the small dye space, to a guide roller below, which deflects the goods from the vertical plane to the horizontal plane so that it passes through the nip between the rollers disposed vertically. There is another small dye trough through which the goods can be directed on its course between the two nips. This can be used to subject the goods to the influence of other reagents, or for a second passage through the original dye liquor. The amount of dye liquor is very small and exposes a minimum surface to the



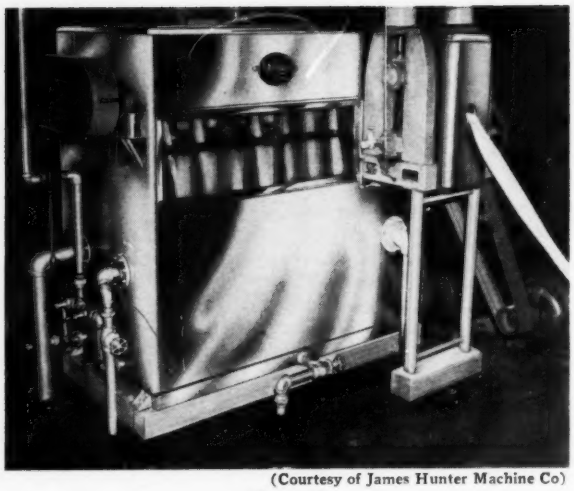
(Courtesy of R Funke, representing Benteler-Werke)

Figure 1—Ager



(Courtesy of the "Dyer")

Figure 2



(Courtesy of James Hunter Machine Co)

Figure 3

air, a decided advantage in dyeing reduced vat colors.

* * *

Hosiery dyers undoubtedly will be interested in the subject matter of British Patent 702,424, which covers the invention of a French manufacturer of dyeing machinery and pertains to the continuous pre-treating, scouring, dyeing, finishing and drying of hosiery. The hosiery is mounted on forms at the beginning of the process and is removed at the end of the series of operations, ready for boxing. It is said to eliminate runs, creases and other common types of defects.

BLEACHING

Advance news of a new high-speed rope-washing machine for a cotton bleachery (see Figure 3) indicates that the unit has many advantages. The tensioning of the fabric is controlled by means of positioning pins which locate each strand of fabric on a driven cone-reel. The positioning pin is controlled through a system of rotochambers across the top of the machine (not shown in the photograph). The operator can, therefore, regulate the tension on each piece to that best suited to the particular quality being processed. All of the advantages of high-speed, tension-free rope washing are obtained, together with complete control of the fabric. The device is fitted with entering and leaving squeeze rolls. The entering squeeze rolls will pull the fabric from any existing position, even remotely located from the washer, without permitting tensions on the rope coming up to the washer to affect the tensionless condition prevailing inside the washer. A compensator located within the washer further helps to control the tension in the washer. It is said to be suitable for very high speed work, although this characteristic does not in any way affect its use for lower speed washing.

PRINTING

Two suggested types of screen printing machines are discussed in a recent issue of a foreign technical journal. In both types the cloth to be printed is stretched around a cylinder and the screens are put in contact with the cloth tangentially, the cylinder being given a rocking motion, until the necessary applications of color through the screen are completed. Following this the cylinder is rocked further and it holds the goods for drying in the chamber in which the cylinder substantially resides, except for the small part of its periphery which is being printed. The article does not go into too much detail regarding the method of driving the moving parts, but the possibilities appear to be quite interesting. Work on these alternative ideas seems presently to be confined to laboratory-size apparatus.

* * *

Another article, which appeared in the Danish magazine *"Tidsskrift for Textilteknik,"* describes a semi-automatic screen printing device, which eliminates the operations of pinning or gumming the goods to the back grey on the table. It features a series of two elevator-like arrangements for taking away the screens as used and returning them to the spot on the table where the actual printing takes place, at the right time, where the scraping with the squeegee is carried out by hand. Another important feature of this machine is the printing blanket, which is washed and dried by a blanket washer and drier located underneath the machine as each length of goods is printed. The inventor claims that the arrival of the blanket hot from the drier hastens the drying of the freshly printed goods. Twenty-four (24) repeats of the screen are printed at a time, after which the belt is put in motion again and the printed cloth enters into the drying chamber connected with the machine.

It was recently announced that a celebrated local textile machinery manufacturer would undertake the manufacture of a machine which, according to the patent, looks like a cross between a rotary-printing machine and a screen-printing device. The principle of the apparatus seems to be the conversion of the flat screen into the roller form, the printing color being fed into the interior of the roller by a special arrangement. Pressure of this partly pervious and partly impervious roller is applied against the cloth, which travels in a stretched condition around a drum that looks like the conventional roller-printing type. No doctors are used.

Small working models of the machine are being sent from Europe. The writer hopes to be able to see them in action shortly.

* * *

A patent issued in India deals with a new composition for preparing printing screens, consisting of a polyvinyl chloride polymer with a suitable catalyst or plasticizer together with some pigments. It is said to have important advantages over the conventional type of compound, including durability, chemical resistance to acid and alkaline printing pastes, easy cleaning, toughness and flexibility.

* * *

In a new form of spiral steamer, the goods are led into the ager into a system of rollers arranged in spiral form, so that only the back of the goods touches the rollers. On arrival at the center of the spiral, the goods are transferred to the center of a second spiral immediately above the lower one. They are then led around this spiral and out into the air again.

The entering and exit slots of the machine are protected by similar devices to those employed in the conventional ager. The machine is driven by a fixed speed

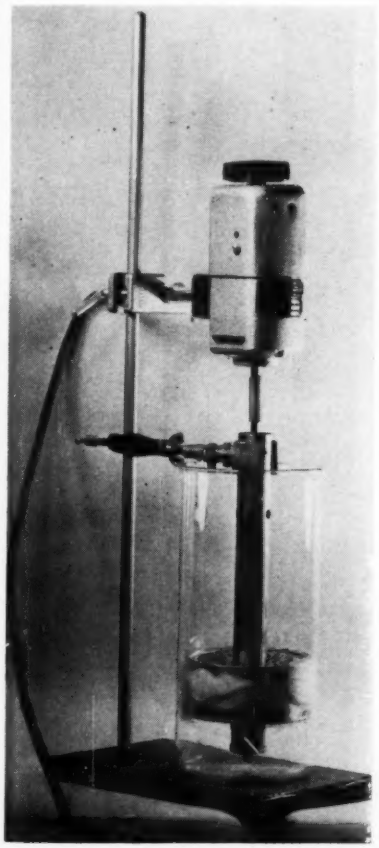
motor operating through a variable-speed gear having a ratio of 1:4, so that the passage can be varied from 3 to 12 minutes.

FINISHING

A vogue for embossed effects has given rise to a small flood of patents bearing on improved means of producing these very special types of finish. It will suffice to mention two of these.

The first concerns itself with the production of relief-printed lacquered effects by printing on the goods "suitable precipitating agents" and then treating the goods with emulsions of resins in various stages of polymerization or with monomers of the same capable of forming polymers, natural or synthetic rubber latices, or similar substances. This is a Swiss invention.

Another patent held by a Southern printworks covers a combination of an embossing calander with a printing machine attachment, which makes it possible to simultaneously emboss the goods and print either the relief part of the embossing or the embossed ground, leaving the relief pattern unprinted at will.



(Courtesy of Ralph Cuthbert Ltd)

Figure 4

LABORATORY EQUIPMENT

The problem of making satisactory laboratory dyeings on loose fibers, slubbing roving and similar forms is well known. However, through the inventiveness and ingenuity of Dr G H Lister and his colleagues at the Bradford Laboratory of Sandoz Products, Ltd, two very practical pieces of laboratory dyeing apparatus are now available. (See Figures 4 and 5).

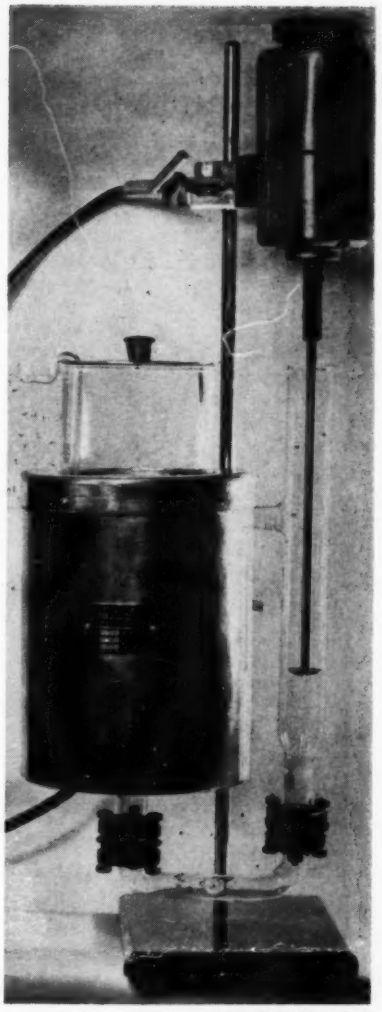
These two pieces of simple, yet effective, machinery appear to be more capable of simulating the dyeing conditions met with in practice than any similar laboratory devices that we have ever seen.

The simpler and apparently less costly of the two consists of a central metal cylinder with a fixed perforated bottom flange and a movable perforated top plate. The top of the central tube has four holes a few inches below the top and a few inches above a tightly fitting propeller, which is actuated by a 1/30th HP Motor. The tube fits closely into a 2-liter beaker and is clamped so that the lower end of the tube is about half an inch above the bottom of the beaker. When the motor is running, the dye liquor is drawn up from the bottom of the beaker and ejected through the four holes toward the top of the tube; it falls by gravity through the material between the two flanges, every two minutes the cycle is completed. The slubbing is wound around the central tube, starting at the lower plate and distributing it evenly in the space available. Hot water is poured down the central tube and it rises through the stock, forcing out the air. Just enough water is used to cover the top perforated plate. The whole assembly is mounted on a tripod and heated by means of a Bunsen burner. When the goods are well wetted out, the dye is added and the temperature raised to the desired point. On completion of the dyeing, the liquor is syphoned out of the beaker and the system allowed to cool before washing and drying.

The other apparatus is somewhat more elaborate in construction, but, like the one already described, it is provided with a unidirectional flow, which is said to be satisfactory. Both machines appear to be eminently practical, being easy to load and operate, and easy to clean.

MISCELLANEOUS

At a recent meeting of the American Chemical Society in New York, Robert W Phillip, vice president in charge of development and research, Callaway Mills Co, La Grange, Ga, told of the growth of the chemical industry in the last 30 years and traced a connection between the increased requirements of the textile industry for chemicals of many varied types. He expressed the opinion that the sale of dyestuffs could be expected to attain the large total of 260 million pounds in 1962, and the still larger figure of 400 million pounds in 1975. He looks for rayon and acetate to represent 20% of total textiles and other synthetics at nearly that figure, in a total fiber consumption at that time 70% higher than today's requirements.



(Courtesy of Ralph Cuthbert Ltd)

Figure 5

* * *

The First World Congress on Detergency was held this year at the Sorbonne in Paris, from August 30th to September 3rd. It was attended by 1200 delegates from 32 nations. The program was intensely interesting and most comprehensive.

* * *

The only nylon producing plant in Britain, owned jointly by ICI and Courtaulds Ltd, is turning out 10 million pounds a year. It is reported that this production is to be increased to 30 million pounds annually by the end of next year.

ABSTRACTS

The Dyeing of Nylon 6

H R Hadfield, *Textile Mfr* 80, 42, January, 1954.

The practice has been adopted, according to the author, of comparing the properties of nylon 6 (i e, the caprolactam fiber manufactured under the names "Perlon," "Grilon," "Mirlon," and "Enkalon") with nylon 66, because the dyer who is familiar with the latter fiber can use his knowledge of it in dyeing nylon 6.

Fabrics and hose made from nylon 66 must be "set" to impart dimensional stability. The same is true of nylon 6, but the temperature range over which this fiber can be set satisfactorily is much shorter than in the case of nylon 66.

The methods for bleaching nylon 66 may also be used for nylon 6.

Nylon 6 may be satisfactorily dyed with selected disperse, azoic, Solacet, level dyeing acid, acid milling, premetallized, direct, chrome, and vat dyes, but different dyeing properties are found when compared with nylon 66.

It has been found that there are two fundamental properties of nylon 6 which are responsible for these differences in dyeing behavior: nylon 6 has a more open molecular structure compared with nylon 66, and the saturation values for acid dyes (i e, anionic type) on nylon 6 are usually widely different from those on nylon 66. These differences are very important.

The same disperse dyes recommended for nylon 66 are suitable for nylon 6, but the more rapid rate of dyeing of the latter fiber can lead to unlevel results. It is therefore recommended that where this is the case, the dyeing should be started at a lower temperature.

The dyeing behavior of the anionic-type dyes on nylon 6 can differ markedly from the behavior on nylon 66, and behavior on nylon 6 can also vary considerably according to the source of manufacture. The more open molecular structure of nylon 6 is not as important in dyeing with anionic dyes as with disperse dyes, but the saturation value (amine end content) is of the greatest importance. The author states that certain sources of nylon 6 have a higher saturation value than nylon 66, while other sources have a lower value.

In general, the lightfastness of dyes on nylon 6 is the same as on nylon 66.—WHC

Problems of the Garment Dyer and Finisher, including the Dyeings of Buttons

B Kramrisch and A E Bratt, *J Soc Dyers Colourists* 70, 173-183, May, 1954.

The work of the garment dyer today is complicated by the advent of man-made fibers, which are used both alone and mixed with natural fibers. Moreover, the wide range of special finishes applied to textile materials destined for clothing and furnishings represents an added problem, as they are likely to interfere with dyeing processes.

In contrast to the textile dyer, who normally processes virgin materials, the garment dyer has to cope with materials whose dyeing properties have been altered by the action of light, perspiration, industrial atmospheres, washing, deodorants, and other toilet preparations.

In addition, garments may contain buttons and other decorations made from a wide range of natural and artificial plastic materials. They differ considerably in their physical and dyeing behavior, so that wherever possible they should be removed from the garment prior to dyeing and if necessary dyed separately.

The authors discuss garment dyeing under the following headings: all-wool garments and unions with cotton or rayon; wool and polyamide fibers; nylon and other synthetics; mixtures of wool and synthetics; regenerated protein fibers; mixtures of cotton or rayon with nylon and with other synthetics; mixtures of acetate and nylon; and silk and linen. The redyeing of rain-coats, curtains, loose covers, and carpets is included.

Shrink-resists on wool, embossed and glazed chintz finishes on cotton, and crease-resists on rayon are also discussed.

Buttons may be made from metals (e g, anodized aluminum), vegetable materials (wood, vegetable ivory), animal materials (horn, bone, ivory, shell, mother-of-pearl, casein), and plastics, both thermosetting (phenol-, urea-, and melamine-formaldehyde) and thermoplastic (methyl methacrylate, cellulose acetate, polyvinyl chloride, nylon, polystyrene, and polyethylene). The authors furnish data for dyeing all of these classes of materials.—WHC

GENERAL CALENDAR

AMERICAN SOCIETY FOR TESTING MATERIALS

1955 Committee Week—Jan 31-Feb 4, Netherland Plaza Hotel, Cincinnati, O

1955 Annual Meeting—June 26-July 1, Chalfonte-Haddon Hall, Atlantic City, N J.

AMERICAN SOCIETY FOR QUALITY CONTROL

Annual meeting, Textile Div—Jan 27-29, Clemson College School of Textiles.

DELTA KAPPA PHI FRATERNITY

1955 Annual Convention—April 29-30, Lowell, Mass.

DEUTSCHE GESELLSCHAFT FUR CHEMISCHES APPARATEWESEN

Achema XI—May 14-22, Frankfurt am Main, Germany.

DRYSALTERS CLUB OF NEW ENGLAND

Jan 24, April 29 (Hotel Vendome, Boston, Mass); June 24 (Outing—Wachusett Country Club, W Boylston, Mass).

THE FIBER SOCIETY

Spring Meeting—May 4-5, 1955, Alabama Polytechnic Institute, Auburn, Alabama.

Fall Meeting—Sept 8-9, 1955, Massachusetts Institute of Technology, Cambridge, Mass.

INTERNATIONAL TEXTILE EXHIBITION

2nd Exhibition—June 25-July 10, 1955, Brussels, Belgium.

INTERNATIONAL WOOL TEXTILE RESEARCH CONFERENCE

September, 1955—Sydney, Melbourne, and Geelong, Australia.

NATIONAL ASSOCIATION OF HOSIERY MANUFACTURERS, KNITTED OUTERWEAR ASSOCIATION, THE UNDERWEAR INSTITUTE

42nd Knitting Arts Exhibition—April 25-29, Convention Hall, Atlantic City, N J.

NATIONAL COTTON COUNCIL OF AMERICA

Annual Meeting—Jan 31-Feb 1, Hotel Shamrock, Houston, Tex.

Cotton Research Clinic—Feb 16-18, Pinehurst, N C.

NATIONAL INSTITUTE OF DRYCLEANING

4th Educational Conference—Dec 5-10, Silver Spring, Md.

NEW YORK PIGMENT CLUB

Dec 9, Jan 15.

PHI PSI FRATERNITY

52nd Annual Convention — April 7-9, Lowell Technological Institute, Lowell, Mass.

TEXTILE RESEARCH INSTITUTE

25th Annual Meeting—March 10-11, Hotel Commodore, New York, N Y.

The Index to Volume 43 of the American Dyestuff Reporter will appear in the December 20th issue.

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